

DAHLGREN DIVISION NAVAL SURFACE WARFARE CENTER

Dahlgren, Virginia 22448-5100



NSWCDD/TR-05/89

AN INVERSE OF THE CIRCULAR COVERAGE FUNCTION

BY ARMIDO DIDONATO

FORCE WARFARE SYSTEMS DEPARTMENT

JANUARY 2005

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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE January 2005	3. REPORT TYPE AND DATES COVERED Final	
4. TITLE AND SUBTITLE An Inverse of the Circular Coverage Function			5. FUNDING NUMBERS	
6. AUTHOR(s) Armido DiDonato				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Commander Naval Surface Warfare Center Dahlgren Division (Code T10) 17320 Dahlgren Road Dahlgren, VA 22448-5100			8. PERFORMING ORGANIZATION REPORT NUMBER NSWCDD/TR-05/89	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) <p>This report describes an algorithm, INCIR, to evaluate an inverse of the Circular Coverage Function, CIR. Given a two-dimensional normal distribution function with mean zero and equal unit standard deviations and a target located at (h, k); R, the radius of the circle, C, with center at (h, k) is determined for a specified probability of a shot falling within C.</p> <p>A Fortran 77 subroutine, INVCIR, is available that is based on INCIR, which produces R to eight significant digits for $10^{-8} \leq P \leq 1 - 10^{-8}$ and $0 \leq d \equiv (h^2 + k^2)^{1/2} \leq 10^8$.</p> <p>A table of R versus P and d is included.</p>				
14. SUBJECT TERMS algorithm, INCIR, inverse, Circular Coverage Function, CIR, INVCIR			15. NUMBER OF PAGES 48	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORTS UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL	

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FOREWORD

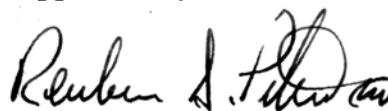
The algorithm described in this report is the basis for the Fortran software of an important statistical function that is not contained in the NSWC Library of Mathematics Subroutines. The software can be used in targeting studies when statistical confidence regions are required.

Dr. John Crigler (B10) supplied the external distribution list.

The editorial assistance of David Bozicevich (B60) is appreciated.

This document was reviewed by Robert G. Hill, Head, Warfare Systems Division.

Approved by:

A handwritten signature in black ink, appearing to read 'Reuben S. Pitts', with a stylized flourish at the end.

REUBEN S. PITTS, Head
Force Warfare Systems Department

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I. INTRODUCTION

The Circular Coverage Function, CIR, defines a probability function $P(R,d)$, [2]. CIR gives the probability that a shot falling under a bivariate uncorrelated normal distribution with mean zero and equal standard deviations, $u = v$, lands in a circle, in the x - y plane, of radius \bar{R} centered at $x = \bar{h}$, $y = \bar{k}$. It can be expressed as

$$P(\bar{R}/u, \bar{h}/u, \bar{k}/u) = \frac{1}{2\pi u^2} \int_{\bar{h}-\bar{R}}^{\bar{h}+\bar{R}} \int_{\bar{k}-\sqrt{\bar{R}^2-(x-\bar{h})^2}}^{\bar{k}+\sqrt{\bar{R}^2-(x-\bar{h})^2}} \exp\left\{-\frac{1}{2}\left[\left(\frac{x}{u}\right)^2 + \left(\frac{y}{u}\right)^2\right]\right\} dy dx. \quad (1)$$

Transforming to polar coordinates, with $x - \bar{h} = r \cos \theta$, $y - \bar{k} = r \sin \theta$ yields

$$P(\bar{R}/u, \bar{h}/u, \bar{k}/u) = \frac{1}{2\pi u^2} \int_0^{\bar{R}} \int_0^{2\pi} \exp\left\{-\frac{1}{2}\left[\left(\frac{\bar{h} + r \cos \theta}{u}\right)^2 + \left(\frac{\bar{k} + r \sin \theta}{u}\right)^2\right]\right\} r d\theta dr. \quad (2)$$

Since $u = v$, the distribution is circular, hence the circle of integration can be taken as offset along the positive x -axis. Thus (2) reduces to

$$P(R, d) = \exp(-d^2/2) \int_0^R \exp[-r^2/2] I_0(rd) r dr, \quad (3)$$

where

$$I_0(w) \equiv \frac{1}{\pi} \int_0^\pi \exp(w \cos \theta) d\theta. \quad (4)$$

Here $I_0(w)$ denotes the modified Bessel function of the first kind and zero order [1, p.375] and

$$R \equiv \bar{R}/u, \quad h \equiv \bar{h}/u, \quad k \equiv \bar{k}/u, \quad d \equiv \sqrt{(h^2 + k^2)}. \quad (5)$$

Introducing the MacLaurin series and the asymptotic expansion for I_0 , [1, p.375, p.377], recurrence relations are developed which are used to generate an algorithm that efficiently and accurately evaluates P (see [2]).

The objective of this report is to describe an algorithm upon which a Fortran computer program, INVCIR, is based to determine R , given P, d . This program can be used as a tool in evaluating the accuracy of a weapon.

For example, consider a target located at the origin of the x - y plane and a set of miss distances normally distributed in the x and y directions [6], [7] that are independent, with mean zero and standard deviations u, u . Then, approximating the standard deviation from the data, say \hat{u} , one asks what is the radius, R , of the circle, C , centered at (h, k) , which contains P of the distribution, i.e., for which a shot has a probability P of falling within C [6], [7].

In Appendix A, the six-decimal-digit inverse $P(R, d)$ table of [2] is extended from six-seven significant digits to seven-eight significant digits.

II. ANALYSIS TO DETERMINE R ($\bar{R} = R$)

In INVCIR, a special case is treated first. When $d = 0$, then $P = 1 - \exp(-R^2/2)$. Therefore,

$$R = \sqrt{-2 \log(1 - P)}, \quad \text{if} \quad d = 0, \quad (IR = 0)^1. \quad (6)$$

In order to find R in the general case, where $d \neq 0$ and $P = \hat{P}$ are given, the classical Newton-Raphson root-finding procedure (N-R) is used [4, p.129]. Denoting the n th approximation or iterate for R by R_n , with d constant,

$$R_{n+1} = R_n - \frac{\exp(-d^2/2) \int_0^{R_n} \exp[-r^2/2] I_0(rd) r dr - \hat{P}}{(\partial P / \partial R)_{R=R_n}}, \quad n = 0, 1, 2, \dots, \quad (7)$$

where

$$\frac{\partial P}{\partial R} = R \exp\left(-\frac{R^2 + d^2}{2}\right) I_0(Rd), \quad (8)$$

or if $R > 1.7$ and $Rd > 16$ (see [2]) then

$$\frac{\partial P}{\partial R} = R \exp\left(-\frac{(R - d)^2}{2}\right) [\exp(-Rd) I_0(Rd)]. \quad (9)$$

There are two basic problems associated with using N-R:

1. A condition for stopping the iteration procedure is needed, i.e., deciding when an acceptable approximation for R has been reached.
2. A value for R_0 , which initiates the N-R, is needed so that rapid convergence is assured.

The first problem was resolved by requiring that the iteration be stopped when

$$|R_{n+1} - R_n| \leq R_{n+1} \text{eps}, \quad (10)$$

where eps is a prespecified small positive number. It was found unnecessary to utilize the stopping rule:

$$|P(R_{n+1}, d) - \hat{P}| \leq \hat{P} \text{eps}. \quad (11)$$

The second problem required extensive testing and some analysis to resolve satisfactorily. The solution adopted distinguishes this work from that carried out in [2]. The reasoning will be heuristic.

Values for R_0 were considered using the results of [3], but those did not do as well, in some cases, as the starting values given below.

By (6), it can be assumed $d > 0$. Then five choices were made for R_0 depending on the input values of P and d .

¹IR is used in INCIR and defined in the next section.

First, consider expanding the integrand of (3) in a MacLaurin series in the integration variable r and integrating the result. Then one obtains, letting $T = P \exp(d^2/2)$,

$$T = \sum_{j=1}^{j=\infty} a_j R^{2j}, \quad (12)$$

$$a_1 = 1/2, \quad a_2 = d^2/16 - 1/8, \quad a_3 = d^4/384 - d^2/48 + 1/48.$$

Hence, R_0 can be obtained, for a region of the P - d plane, by inverting the series. Thus, with $y \equiv \sqrt{2T}$, $D2 \equiv d^2/2$, the first three terms of the inverted series are used.

$$R_0 = y [1 + (1 - D2)y^2/8 + (17D2^2 - 26D2 + 13)y^4/384], \quad \text{if } T < .099. \quad (\text{IR} = 1) \quad (13)$$

Since, as noted above,

$$P(R, 0) = 1 - \exp(-R^2/2), \quad (14)$$

we extend the use of (6) so that, if the inequality in (13) is not satisfied, then

$$R_0 = \sqrt{-2 \log(1 - P)}, \quad \text{if } d \leq 0.20. \quad (\text{IR} = 2) \quad (15)$$

If the inequalities in (13) and (15) do not hold, the three following estimates are used for R_0 with the region of the P - d plane where they apply specified by inequalities. If

$$d \geq 2.5 \text{ or } (P > .99 \text{ and } d \geq .70), \quad (16)$$

then

$$R_0 = \sqrt{(d+x)^2 + 1} \quad \text{if } d+x > .50, \quad (\text{IR} = 3) \quad (17)$$

where x is given by [1, p. 931, (26.2.2)]

$$P = 1/\sqrt{2\pi} \int_{-\infty}^x \exp(-t^2/2) dt, \quad (18)$$

and is obtained from the subroutine DPNI($P, Q, P-.5, x, \text{IN}$)² of [5].

If the conditions in (16) hold, and $d+x \leq .5$, then [1, p. 940, (26.3.26)]

$$R_0 = \sqrt{(2+d^2)B^3}/1.50,^3 \quad B = x/\sqrt{9a} + 1 - 1/(9a), \quad (\text{IR} = 4) \quad (19)$$

where a is defined in (21). Finally, if the conditions in (16) do not hold, then from [3]

$$R_0 = \sqrt{[2z(1+d^2)/(1+D2)]}, \quad (\text{IR} = 5) \quad (20)$$

where z is given by [1, p. 260, (6.5.1)]

$$P = 1/\Gamma(a) \int_0^z \exp(-t) t^{a-1} dt, \quad a \equiv (1+D2)^2/(1+d^2), \quad (21)$$

² $Q \equiv 1 - P$; IN is an error parameter.

³The factor 1.50 was an adjustment of ours.

and is obtained from the subroutine GAMINV (a, z, zo, P, Q, IND) of [5]. zo is an optional initial approximation for z and IND reports the status of the results.

IR is an output parameter of INVCIR that identifies which R_0 was chosen. (See the next section.)

III. DESCRIPTION OF THE FORTRAN 77 SUBROUTINE INVCIR

In this section, the subroutine INVCIR is discussed further. Its call line is:

Call INVCIR(P, d, R, ij, R_0 , IR)

This routine, with 28 supporting routines taken from [5], is written in Fortran 77 in double-precision. Thus, on an IBM PC approximately 15 decimal digits are available. The inputs are P and d. The outputs are R, ij, R_0 , IR. IR plays a dual role, namely as an error parameter and also to indicate the choice for R_0 as noted in the previous section.

If IR is negative, then an unacceptable input has been given. $R = -10^{10}$ is returned. In particular:

If IR = -1 then $P \geq 1$ or $P < 0$.

If IR = -2 then $d < 0$.

The integer ij represents the number of calls to the N-R procedure. The output $R = \bar{R}/u$.

INVCIR is designed to give a minimum of eight significant digits for R when eps is set to $5 \cdot 10^{-9}$, and P and d are constrained to

$$10^{-8} \leq P \leq 1 - 10^{-8}, \quad 0 \leq d \leq 10^8.$$

The routine is also efficient. Extensive testing showed a maximum for ij of six and an average for ij of three, indicating that the choices for R_0 are quite good.

As an example of how to use the routine, assume $P = .40$, $\bar{h} = 3.0$, $\bar{k} = 4.0$, $u = v = 2.0$. Then the input is $P = .40$, $d = \sqrt{\bar{h}^2 + \bar{k}^2}/u = 2.50$. INVCIR yields $ij = 3$, $R_0 = 2.45915620$, $R = 2.45457329$. (see page A-9.) Hence $\bar{R} = R * u = 4.90914658$.

IV. REFERENCES

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APPENDIX A

TABULATION OF R AS A FUNCTION OF P AND d

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TABLE A-1. TABULATION OF R AS A FUNCTION OF P AND d

Constant value of P on a row. Constant value of d on a column.

Example 1: $P = .31$, $d = .40$, $R = 0.8963486$ see Page A-5
 Example 2: $P = .9990$, $d = 20.0$, $R = 23.113476$ See Page A-26

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$P \backslash d$	0.0	0.1	0.2	0.3	0.4	0.5	0.6	$\bar{R} = R * u$,	0.7	0.8	0.9	1.0	d/P
.01	0.1417768	0.1421317	0.1432016	0.1450026	0.1475616	0.1509174	0.1551215	0.1602388	0.1663501	0.1735531	0.1819651	.01	
.02	0.2010110	0.2015141	0.2030310	0.2055839	0.2092108	0.2139659	0.2199208	0.2271661	0.2358132	0.2459966	0.2578761	.02	
.03	0.2468166	0.2474344	0.2492967	0.2524309	0.2568827	0.2627179	0.2700229	0.2790666	0.2895026	0.3019709	0.3165000	.03	
.04	0.2857341	0.2864493	0.2886052	0.2922329	0.2973849	0.3041361	0.3125848	0.3228548	0.3350965	0.3494893	0.3662429	.04	
.05	0.3202914	0.3210931	0.3235096	0.3275753	0.3333484	0.3409114	0.3503729	0.3618684	0.3755624	0.3916494	0.4103549	.05	
.06	0.3517823	0.3526628	0.3553167	0.3597813	0.3661198	0.3744213	0.3848030	0.3974105	0.4124197	0.4300372	0.4505002	.06	
.07	0.3809743	0.3819278	0.3848017	0.3896360	0.3964979	0.4054828	0.4167150	0.4303489	0.4465697	0.4655935	0.4876662	.07	
.08	0.4083665	0.4093886	0.4124689	0.4176499	0.4250025	0.4346273	0.4466553	0.4612480	0.4785986	0.4989305	0.5224957	.08	
.09	0.4343056	0.4353926	0.4386684	0.4441773	0.4519941	0.4622239	0.4750031	0.4904998	0.5089134	0.5304731	0.5554346	.09	
.10	0.4590436	0.4601925	0.4636546	0.4694763	0.4773352	0.4885408	0.5020344	0.5183894	0.5378104	0.5605306	0.5868077	.10	
.11	0.4827708	0.4839790	0.4876198	0.4937413	0.5024238	0.5137806	0.5279344	0.5451318	0.5655128	0.5893363	0.6168599	.11	
.12	0.5056350	0.5069005	0.5107134	0.5171235	0.5262139	0.5381007	0.5529336	0.5708943	0.5921944	0.6170714	0.6457818	.12	
.13	0.5277539	0.5290747	0.5330541	0.5397434	0.5492277	0.5616264	0.5770922	0.5958099	0.6179933	0.6438804	0.6737248	.13	
.14	0.5492229	0.5505974	0.5547384	0.5616984	0.5715648	0.5844593	0.6005374	0.6199865	0.6430217	0.6698803	0.7008119	.14	
.15	0.5701209	0.5715477	0.5758460	0.5830694	0.5933071	0.6066833	0.6233557	0.6435134	0.6673722	0.6951679	0.7271448	.15	
.16	0.5905140	0.5919918	0.5964435	0.6039238	0.6145235	0.6283687	0.6456191	0.6664651	0.6911223	0.7198239	0.7528084	.16	
.17	0.6104582	0.6119859	0.6165875	0.6243189	0.6352722	0.6495752	0.6673891	0.6889050	0.7143378	0.7439173	0.7778748	.17	
.18	0.6300015	0.6315781	0.6363267	0.6443040	0.6556034	0.6703540	0.6887183	0.7108875	0.7370751	0.7675068	0.8024060	.18	
.19	0.6491857	0.6508103	0.6557031	0.6639216	0.6755603	0.6907495	0.7096522	0.7324596	0.7593831	0.7906436	0.8264556	.19	
.20	0.6680472	0.6697190	0.6747536	0.6832091	0.6951809	0.7108004	0.7302308	0.7536626	0.7813047	0.8133722	0.8500705	.20	
.21	0.6866183	0.6883365	0.6935106	0.7021993	0.7144988	0.7305409	0.7504892	0.7745328	0.8028774	0.837321	0.8732920	.21	
.22	0.7049275	0.7066914	0.7120032	0.7209216	0.7335437	0.7500017	0.7704587	0.7951025	0.8241349	0.8577582	0.8961567	.22	
.23	0.7230004	0.7248095	0.7302570	0.7394021	0.7523423	0.7692098	0.7901673	0.8154005	0.8451070	0.8794818	0.9186976	.23	
.24	0.7408601	0.7427139	0.7482955	0.7576645	0.7709185	0.7881898	0.8096403	0.8354530	0.8658210	0.9009310	0.9409442	.24	
.25	0.7585276	0.7604256	0.7661398	0.7757301	0.7892942	0.8069641	0.8289005	0.852836	0.8863011	0.9221315	0.9629233	.25	
.26	0.7760220	0.7779638	0.7838093	0.7936185	0.8074892	0.8255530	0.8479688	0.8749137	0.9065698	0.9431065	0.9846593	.26	
.27	0.7933609	0.7953460	0.8013215	0.8113477	0.8255219	0.8439751	0.8668643	0.8943632	0.9266476	0.9638773	1.0061746	.27	
.28	0.8105604	0.8125885	0.8186931	0.8283942	0.8434091	0.8622476	0.8856048	0.9136503	0.9465532	0.9844637	1.0274897	.28	
.29	0.8276356	0.8297063	0.8359390	0.8463934	0.8611663	0.8803865	0.9042066	0.9327918	0.9630343	1.0048837	1.0486237	.29	
.30	0.8446004	0.8467136	0.8530734	0.8637396	0.8788083	0.8984068	0.9226851	0.9518036	0.9859172	1.0251544	1.0695945	.30	
.31	0.8614681	0.8636235	0.8701097	0.8809863	0.8963486	0.9163223	0.9410545	0.9707004	1.0054071	1.0452917	1.0904185	.31	
.32	0.8782511	0.8804484	0.8870604	0.8981461	0.9138001	0.9341463	0.9593283	0.9894961	1.0247883	1.0653105	1.1111114	.32	
.33	0.8949610	0.8972000	0.9039372	0.9152310	0.9311750	0.9518911	0.9775194	1.0082039	1.0440745	1.0852248	1.1316879	.33	
.34	0.9116090	0.9138896	0.9207515	0.9322525	0.9484850	0.9695687	0.9956397	1.0268361	1.0632786	1.1050481	1.1521620	.34	
.35	0.9282057	0.9305279	0.9375139	0.9492213	0.9657411	0.9871903	1.0137011	1.0454048	1.0824128	1.1247932	1.1725470	.35	
.36	0.9447615	0.9471250	0.9542350	0.9661481	0.9829539	1.0047668	1.0317144	1.0639214	1.1014890	1.144722	1.1928555	.36	
.37	0.9612861	0.9636909	0.9709245	0.9830428	1.0001337	1.0223087	1.0496906	1.0823968	1.1205185	1.1640969	1.2130999	.37	
.38	0.9777891	0.9802352	0.9875923	0.9999153	1.0172904	1.0398260	1.0676399	1.1008418	1.1395123	1.1836787	1.2332919	.38	
.39	0.9942800	0.9967672	1.0042476	1.0167751	1.0344338	1.0573288	1.0855724	1.1192667	1.1584811	1.2032286	1.2534430	.39	
.40	1.0107677	1.0132961	1.0208997	1.0336314	1.0515732	1.0748265	1.1034981	1.1376817	1.1774352	1.2227573	1.2735644	.40	
.41	1.0272612	1.0298308	1.0375577	1.0504935	1.0687180	1.0923288	1.1214266	1.1560966	1.1963850	1.2422754	1.2936668	.41	
.42	1.0437693	1.0463802	1.0542304	1.0673703	1.0858773	1.1098448	1.1393675	1.1745213	1.2153404	1.2617932	1.3137611	.42	
.43	1.0603008	1.0629530	1.0709267	1.0842709	1.1036062	1.1273840	1.1573302	1.1929654	1.2343114	1.2813210	1.3385578	.43	
.44	1.0768644	1.0795580	1.0876553	1.1012040	1.1202758	1.1449555	1.1753241	1.2114386	1.2533078	1.3008688	1.3539674	.44	
.45	1.0934688	1.0962038	1.1044251	1.1181785	1.1375330	1.1625684	1.1933586	1.2299504	1.2723395	1.3204469	1.3741003	.45	
.46	1.1101226	1.1128993	1.1212447	1.1352034	1.1548409	1.1802320	1.2114431	1.2485105	1.2914163	1.3400652	1.3942668	.46	
.47	1.1268347	1.1296531	1.1381232	1.1522876	1.1722085	1.1979555	1.2295870	1.2671284	1.3105480	1.3597339	1.4144774	.47	
.48	1.1436140	1.1464742	1.1550694	1.1694402	1.1896452	1.2157484	1.2477999	1.2858140	1.3297448	1.3794633	1.4347425	.48	
.49	1.1604693	1.1633717	1.1720925	1.1866703	1.2071602	1.2336200	1.2660915	1.3045772	1.3490166	1.3992636	1.4550728	.49	
.50	1.1774100	1.1803547	1.1892017	1.2039874	1.2247631	1.2515802	1.2844716	1.3234280	1.3683737	1.4191453	1.4754791	.50	

$P \backslash d$	0.0	0.1	0.2	0.3	0.4	0.5	$\bar{R} = R * u$,	$\bar{d} = d * u$	0.8	0.9	1.0	d/P
.50	1.1774100	1.1803547	1.1892017	1.2039874	1.2247631	1.2515802	1.2844716	1.3234280	1.3683737	1.4191453	1.4754791	.50
.51	1.1944454	1.1974326	1.2064064	1.2214011	1.2424635	1.2696387	1.3029504	1.3432767	1.3878266	1.4391192	1.4959722	.51
.52	1.2115851	1.2146150	1.2237165	1.2389211	1.2602714	1.2878058	1.3215381	1.3614338	1.4073861	1.4591963	1.5165634	.52
.53	1.2288390	1.2319120	1.2411418	1.2565576	1.2781972	1.3060918	1.3402454	1.3806101	1.4270632	1.4793876	1.5372641	.53
.54	1.2462173	1.2493337	1.2586928	1.2743210	1.2962514	1.3245077	1.3590832	1.399168	1.446892	1.497049	1.5580862	.54
.55	1.2637307	1.2668909	1.2763802	1.2922222	1.3144540	1.3430644	1.3780630	1.4193656	1.4668159	1.5201602	1.5790419	.55
.56	1.2813903	1.2845945	1.2942150	1.3102725	1.3327895	1.3617737	1.3971966	1.4389683	1.4869156	1.5407658	1.6001438	.56
.57	1.2992075	1.3024561	1.3122091	1.3284836	1.3512967	1.3806478	1.4164963	1.4587377	1.5071810	1.5615347	1.6214051	.57
.58	1.3171944	1.3204879	1.3303744	1.3468679	1.3699793	1.3996992	1.4359750	1.4786866	1.5276254	1.5824804	1.6428396	.58
.59	1.3353637	1.3387026	1.3487239	1.3654382	1.3888503	1.4189413	1.4556462	1.4988291	1.5482628	1.6036172	1.6644616	.59
.60	1.3537287	1.3571134	1.3672710	1.3842082	1.4079235	1.4383882	1.4755242	1.5191794	1.5691078	1.6249599	1.6862863	.60
.61	1.3723036	1.3757346	1.3860299	1.4031924	1.4272135	1.4580547	1.4956241	1.5397529	1.5901761	1.6465242	1.7083296	.61
.62	1.3911032	1.3945811	1.4050157	1.4224059	1.4467358	1.4779565	1.5159618	1.5605658	1.6114840	1.6683268	1.7306083	.62
.63	1.4101434	1.4136688	1.4242445	1.4418649	1.4655069	1.4981102	1.5365543	1.5816353	1.6330489	1.6903853	1.7531404	.63
.64	1.4294413	1.4330148	1.4437334	1.4615869	1.4865443	1.5185337	1.5574196	1.6029797	1.6548894	1.7127186	1.7759449	.64
.65	1.4490149	1.4526372	1.4635006	1.4815903	1.5068666	1.5392461	1.5785771	1.6246186	1.6770253	1.7353466	1.7990419	.65
.66	1.4688837	1.4725555	1.4835659	1.5018948	1.5274942	1.5602677	1.6000475	1.6465731	1.6994780	1.7582909	1.8224534	.66
.67	1.4890686	1.4927907	1.5039503	1.5225220	1.5484485	1.5816205	1.6218530	1.6688656	1.7222702	1.7815747	1.8462027	.67
.68	1.5095922	1.5133655	1.5246767	1.5434949	1.5697531	1.6033282	1.6440178	1.6915207	1.7454268	1.8052229	1.8703149	.68
.69	1.5304790	1.5343044	1.5457698	1.5648384	1.5914332	1.6254167	1.6665680	1.7145647	1.7689743	1.8292624	1.8948173	.69
.70	1.5517557	1.5556340	1.5672565	1.5865798	1.6135164	1.6479137	1.6895318	1.7380263	1.7929419	1.8537227	1.9197395	.70
.71	1.5734512	1.5773837	1.5891661	1.6087487	1.6360327	1.6708498	1.7129402	1.7619369	1.8173611	1.8786356	1.9451138	.71
.72	1.5955975	1.5995851	1.6115307	1.6313776	1.6590151	1.6942583	1.7368270	1.7863306	1.8422667	1.9040361	1.9709753	.72
.73	1.6182295	1.6222735	1.6343858	1.6545022	1.6824998	1.7181761	1.7612294	1.8112453	1.8676967	1.9299627	1.9973629	.73
.74	1.6413858	1.6454875	1.6577702	1.6781620	1.7065265	1.7426434	1.7861885	1.8367223	1.8936930	1.9564577	2.0243193	.74
.75	1.6651092	1.6692700	1.6817272	1.7024005	1.7311397	1.7677053	1.8117497	1.8628077	1.9203022	1.9835680	2.0518916	.75
.76	1.6894475	1.6936688	1.7063049	1.7272664	1.7563886	1.7934117	1.8379637	1.8895528	1.9475760	2.0113458	2.0801325	.76
.77	1.7144538	1.7187374	1.7315571	1.7528142	1.7823284	1.8198185	1.8648871	1.9170149	1.9755723	2.0398496	2.1091008	.77
.78	1.7401883	1.7445360	1.7575445	1.7791052	1.8090209	1.8469885	1.8925836	1.9452584	2.0043562	2.0691448	2.1388626	.78
.79	1.7667189	1.7711325	1.7843355	1.8062084	1.8365365	1.8749929	1.9211253	1.9743562	2.0340012	2.0993057	2.1694924	.79
.80	1.7941226	1.7986045	1.8120082	1.8342028	1.8649549	1.9039125	1.9505940	2.0043911	2.0645911	2.1304165	2.2010753	.80
.81	1.8224880	1.8270404	1.8406517	1.8631785	1.8943676	1.9338401	1.9810835	2.0354579	2.0962215	2.1625739	2.2337084	.81
.82	1.8519171	1.8565427	1.8703691	1.8932398	1.9248798	1.9648823	2.0127022	2.0676662	2.1290029	2.1958890	2.2675036	.82
.83	1.8825285	1.8872303	1.9012802	1.9245076	1.9566144	1.9971635	2.0455757	2.1011430	2.1630636	2.2304912	2.3025911	.83
.84	1.9144615	1.9192427	1.9335256	1.9571239	1.9897149	2.0308294	2.0798515	2.1360375	2.1985541	2.2665321	2.3391233	.84
.85	1.9478809	1.9527451	1.9672715	1.9912569	2.0243518	2.0660524	2.1157043	2.1725261	2.2356524	2.3041910	2.3772808	.85
.86	1.9829840	1.9879355	2.0027173	2.0271080	2.0607290	2.1030391	2.1533432	2.2108203	2.2745718	2.3436827	2.4172796	.86
.87	2.0200103	2.0250538	2.0401047	2.0649214	2.0990935	2.1420399	2.1930215	2.2511759	2.3155705	2.3852672	2.4593812	.87
.88	2.0592540	2.0643949	2.0797306	2.1049972	2.1397495	2.1833626	2.2350508	2.2939077	2.3589659	2.4292642	2.5039071	.88
.89	2.1010830	2.1063278	2.1219666	2.1477108	2.1830767	2.2273919	2.2798202	2.3394089	2.4051545	2.4760730	2.5512588	.89
.90	2.1459660	2.1513222	2.1672856	2.1935401	2.2295591	2.2746179	2.3278254	2.3881801	2.4546411	2.5262016	2.6019474	.90
.91	2.1945139	2.1999905	2.2163045	2.2431082	2.2798272	2.3256788	2.3797122	2.4408735	2.5080832	2.5803121	2.6566382	.91
.92	2.2475447	2.2531529	2.2698489	2.2972494	2.3347256	2.3814295	2.4363450	2.4983619	2.5663606	2.6392899	2.7162215	.92
.93	2.3061917	2.3119452	2.3290628	2.3571194	2.3954235	2.4430535	2.4989205	2.5618534	2.6306910	2.7043605	2.7819292	.93
.94	2.3720922	2.3780090	2.3955991	2.4243879	2.4636106	2.5122606	2.5691671	2.6330926	2.7028322	2.7772926	2.8555391	.94
.95	2.4477468	2.4538510	2.4719817	2.5016046	2.5418664	2.5916607	2.6497224	2.7147410	2.7854658	2.8607844	2.9397626	.95
.96	2.5372725	2.5435981	2.5623664	2.5929668	2.6344368	2.6855484	2.7449261	2.8111768	2.8830018	2.9592716	3.0390568	.96
.97	2.6482288	2.6548287	2.6743833	2.7061811	2.7491161	2.8018057	2.8627397	2.9304297	3.0035261	3.0808862	3.1615919	.97
.98	2.7971496	2.8041171	2.8247206	2.8581000	2.9029443	2.9576587	3.0205571	3.0900358	3.1646922	3.2433779	3.3251960	.98
.99	3.0348543	3.0424074	3.0646684	3.1005102	3.1482673	3.2059990	3.2717559	3.3437826	3.4206239	3.5011446	3.5844940	.99

$P \backslash d$	$R = P(R, d)$ where probability $P = P(R, d)$, $\bar{R} = R * u$, $\bar{d} = d * u$											d/P
	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	
.01	0.1819651	0.1917251	0.2029977	0.2159751	0.2308816	0.2479760	0.2675543	0.2899508	0.3155363	0.3447113	0.3778935	.01
.02	0.2578761	0.2716398	0.2875061	0.3057266	0.3263868	0.3504059	0.3775332	0.4083401	0.4432054	0.4824934	0.5265225	.02
.03	0.3165000	0.3333095	0.3526508	0.3748076	0.4000941	0.4288494	0.4614274	0.4981804	0.5394348	0.5854600	0.6364337	.03
.04	0.3662429	0.3855986	0.4078284	0.4332337	0.4621389	0.4948814	0.5317959	0.5731906	0.6193184	0.6703437	0.7263118	.04
.05	0.4103549	0.4319351	0.4566749	0.4848828	0.5168818	0.5529946	0.5935229	0.6387199	0.6887594	0.7437057	0.8034918	.05
.06	0.4505002	0.4740750	0.5010531	0.5317431	0.5664582	0.6054978	0.6491232	0.6975280	0.7508986	0.8089396	0.8717623	.06
.07	0.4876662	0.5130604	0.5420692	0.5749958	0.6121378	0.6537658	0.7000963	0.7512630	0.8072894	0.8680724	0.9333800	.07
.08	0.5224957	0.5495696	0.5804435	0.6154107	0.6547489	0.6986961	0.7474226	0.8010032	0.8593954	0.9224291	0.9898149	.08
.09	0.5554346	0.5840737	0.6166762	0.6535226	0.6948674	0.7409137	0.7917852	0.8475009	0.9079584	0.9729314	1.0420858	.09
.10	0.5868077	0.6169154	0.6511317	0.6897214	0.7329134	0.7808748	0.8336833	0.8913054	0.9535855	1.0202503	1.0909313	.10
.11	0.6168599	0.6483536	0.6840852	0.7243015	0.7692046	0.8189245	0.8734946	0.9328326	0.9967358	1.0648921	1.1369066	.11
.12	0.6457818	0.6785895	0.7157505	0.7574921	0.8039880	0.8553317	0.9115135	0.9724064	1.0377664	1.1072491	1.1804405	.12
.13	0.6737248	0.7077831	0.7462980	0.7894757	0.8374609	0.8903108	0.9479748	1.0102850	1.0769611	1.1476328	1.2218720	.13
.14	0.7008119	0.7360646	0.7758660	0.8204005	0.8697833	0.9240360	0.9830094	1.0466780	1.1145504	1.1862950	1.2614744	.14
.15	0.7271448	0.7635412	0.8045688	0.8503891	0.9010876	0.9566515	1.0169549	1.0817586	1.1507241	1.2234428	1.2994714	.15
.16	0.7528084	0.7903028	0.8325020	0.8795440	0.9314848	0.9882780	1.0497037	1.1156717	1.1856406	1.2592484	1.3360489	.16
.17	0.7778748	0.8164257	0.8597469	0.9079524	0.9610691	1.0190182	1.0816078	1.1485401	1.2194340	1.2938574	1.3713632	.17
.18	0.8024060	0.8419753	0.8863730	0.9356890	0.9899213	1.0489600	1.1125834	1.1804690	1.2522190	1.3273937	1.4055473	.18
.19	0.8264556	0.8670082	0.9124408	0.9628187	1.0181115	1.0781797	1.1427338	1.2115494	1.2840944	1.3599641	1.4387151	.19
.20	0.8500705	0.8915742	0.9380030	0.9893980	1.0457010	1.1067439	1.1722518	1.2418604	1.3151462	1.3916611	1.4709655	.20
.21	0.8732920	0.9157167	0.9631062	1.0154769	1.0727437	1.1347113	1.2010812	1.2714717	1.3454498	1.4225658	1.5023846	.21
.22	0.8961567	0.9394747	0.9877916	1.0410998	1.0992875	1.1621340	1.2293188	1.3004451	1.3750720	1.4527496	1.5330483	.22
.23	0.9186976	0.9628828	1.0120963	1.0663063	1.1253754	1.1890586	1.2570153	1.3288353	1.4040718	1.4822757	1.5630235	.23
.24	0.9409442	0.9859723	1.0360534	1.0911320	1.1510458	1.2155267	1.2842160	1.3566915	1.4325021	1.5112007	1.5923699	.24
.25	0.9629233	1.0087714	1.0596931	1.1156092	1.1763336	1.2415763	1.3109619	1.3840581	1.4604107	1.5395752	1.6211411	.25
.26	0.9846593	1.0313059	1.0830427	1.1397674	1.2012704	1.2672416	1.3372902	1.4109752	1.4878405	1.5674449	1.6493851	.26
.27	1.0061746	1.0535994	1.1061274	1.1636333	1.2258854	1.2925541	1.3632847	1.4374793	1.5148305	1.5948513	1.6771456	.27
.28	1.0274897	1.0756737	1.1289703	1.1872318	1.2502050	1.3175423	1.3888267	1.4636039	1.5414166	1.6218322	1.7044620	.28
.29	1.0486237	1.0975488	1.1515927	1.2105857	1.2742539	1.3422330	1.4140947	1.4893796	1.5676313	1.6484222	1.7313707	.29
.30	1.0695945	1.1192434	1.1740144	1.2337161	1.2980550	1.3666507	1.4390651	1.5148349	1.5935049	1.6746529	1.7579048	.30
.31	1.0904185	1.1407751	1.1962540	1.2566430	1.3216293	1.3908183	1.4637625	1.5399958	1.6190652	1.7005538	1.7840950	.31
.32	1.1111114	1.1621603	1.2183290	1.2793848	1.3449969	1.4147571	1.4882099	1.5648871	1.6443381	1.7261521	1.8099696	.32
.33	1.1316879	1.1834143	1.2402556	1.3019590	1.3681765	1.4384871	1.5124286	1.5895313	1.6693478	1.7514731	1.8355549	.33
.34	1.1521620	1.2045519	1.2620493	1.3243821	1.3911856	1.4620274	1.5364390	1.6139502	1.6941169	1.7765404	1.8608757	.34
.35	1.1725470	1.2255870	1.2837250	1.3466697	1.4140411	1.4853956	1.5602599	1.6381637	1.7186667	1.8013765	1.8859549	.35
.36	1.1928555	1.2465330	1.3052966	1.3688368	1.4367587	1.5086089	1.5839096	1.6621911	1.7430173	1.8260020	1.9108143	.36
.37	1.2130999	1.2674027	1.3267776	1.3908977	1.4593538	1.5316834	1.6074052	1.6860504	1.7671877	1.8504370	1.9354743	.37
.38	1.2332919	1.2882083	1.3481812	1.4128662	1.4818409	1.5546346	1.6307030	1.7097591	1.7911961	1.8747003	1.9599545	.38
.39	1.2534430	1.3089619	1.3695197	1.4347554	1.5042340	1.5774774	1.6539989	1.7333336	1.8150597	1.8988098	1.9842732	.39
.40	1.2733664	1.3296750	1.3908054	1.4565783	1.5265468	1.6002261	1.6771280	1.7567899	1.8387952	1.9227827	2.0084484	.40
.41	1.2936668	1.3503591	1.4120502	1.4783473	1.5487925	1.6228948	1.7001650	1.7801434	1.8624185	1.9466355	2.0324968	.41
.42	1.3137611	1.3710253	1.4332657	1.5000748	1.5709839	1.6454970	1.7231242	1.8034089	1.8859451	1.9703843	2.0564351	.42
.43	1.3338578	1.3916845	1.4544634	1.5217726	1.5931337	1.6680459	1.7460194	1.8266010	1.9093901	1.9940445	2.0802790	.43
.44	1.3539674	1.4123475	1.4756545	1.5434526	1.6152542	1.6905546	1.7688642	1.8497337	1.9327680	2.0176312	2.1040439	.44
.45	1.3741003	1.4330252	1.4968503	1.5651266	1.6373578	1.7130358	1.7916721	1.8728210	1.9560933	2.0411591	2.1277450	.45
.46	1.3942668	1.4537283	1.5180620	1.5868060	1.6594565	1.7355023	1.8144560	1.8958765	1.9793799	2.0646427	2.1513969	.46
.47	1.4144774	1.4744676	1.5393006	1.6085027	1.6815625	1.7579665	1.8372292	1.9189136	2.0026419	2.0880962	2.1750143	.47
.48	1.4347425	1.4952538	1.5605774	1.6302280	1.7036877	1.7804411	1.8600046	1.9419459	2.0258929	2.1115336	2.1986115	.48
.49	1.4550728	1.5160978	1.5819036	1.6519938	1.7258444	1.8029386	1.8827952	1.9649867	2.0491466	2.1349691	2.2222028	.49
.50	1.4754791	1.5370108	1.6032907	1.6738118	1.7480446	1.8254715	1.9056140	1.9880493	2.0724169	2.1584166	2.2458023	.50

$P \backslash d$	$R = R(P, d)$ where probability $P = P(R, d)$, $\bar{R} = R * u$, $\bar{d} = d * u$											1.9	2.0	d/P
	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	d/P		
.50	1.4754791	1.5370108	1.6032907	1.6738118	1.7480446	1.8254715	1.9056140	1.9880493	2.0724169	2.1584166	2.2458023	.50		
.51	1.4959722	1.5580039	1.6247501	1.6956939	1.7703008	1.8480527	1.9284741	2.0111473	2.0957174	2.1818901	2.2694243	.51		
.52	1.5165634	1.5790886	1.6462937	1.7176523	1.7926254	1.8706950	1.9513887	2.0342941	2.1190620	2.2054037	2.2930831	.52		
.53	1.5372641	1.6002767	1.6679336	1.7396994	1.8150313	1.8934115	1.9743714	2.0575036	2.1424647	2.2289717	2.3167931	.53		
.54	1.5580862	1.6215802	1.6896820	1.7618478	1.8375313	1.9162157	1.9974358	2.0807897	2.1659399	2.2526085	2.3405691	.54		
.55	1.5790419	1.6430117	1.7115519	1.7841107	1.8601391	1.9391211	2.0205959	2.1041668	2.1895019	2.2763289	2.3644259	.55		
.56	1.6001438	1.6645840	1.7335562	1.8065016	1.8828682	1.9621421	2.0438662	2.1276495	2.2131657	2.3001479	2.3883788	.56		
.57	1.6214051	1.6863105	1.7557089	1.8290343	1.9057331	1.9852930	2.0672615	2.1512529	2.2369467	2.3240812	2.4124435	.57		
.58	1.6428396	1.7082052	1.7780240	1.8517235	1.9287486	2.0085891	2.0907972	2.1749926	2.2608607	2.3481446	2.4366360	.58		
.59	1.6644616	1.7302828	1.8005165	1.8745843	1.9519301	2.0320461	2.1144892	2.1988849	2.2849240	2.3723547	2.4609730	.59		
.60	1.6862863	1.7525587	1.8232019	1.8976326	1.9752937	2.0556804	2.1383542	2.2229465	2.3091537	2.3967288	2.4854720	.60		
.61	1.7083296	1.7750488	1.8460968	1.9208851	1.9988564	2.0795091	2.1624097	2.2471952	2.3335676	2.4212848	2.5101511	.61		
.62	1.7306083	1.7977705	1.8692184	1.9443593	2.0226360	2.1035503	2.1866739	2.2716495	2.3581844	2.4460415	2.5350291	.62		
.63	1.7531404	1.8207417	1.8925851	1.9680739	2.0466515	2.1278232	2.2111662	2.2963288	2.3830238	2.4710189	2.5601261	.63		
.64	1.7759449	1.8439817	1.9162164	1.9920485	2.0709227	2.1523480	2.2359070	2.3212538	2.4081066	2.4962377	2.5854630	.64		
.65	1.7990419	1.8675111	1.9401329	2.0163043	2.0954709	2.1771462	2.2609180	2.3464464	2.4334549	2.5217202	2.6110622	.65		
.66	1.8224534	1.8913518	1.9643571	2.0408636	2.1203189	2.2022406	2.2862224	2.3719299	2.4590920	2.5474900	2.6369474	.66		
.67	1.8462027	1.9155274	1.9889126	2.0657506	2.1454909	2.2276559	2.3118448	2.3977291	2.4850430	2.5735722	2.6631439	.67		
.68	1.8703149	1.9400634	2.0138253	2.0909912	2.1710132	2.2534183	2.3378119	2.4238709	2.5113349	2.5999940	2.6896788	.68		
.69	1.8948173	1.9649872	2.0391227	2.1166134	2.1969139	2.2795565	2.3641522	2.4503841	2.5379967	2.6267843	2.7165813	.69		
.70	1.9197395	1.9903288	2.0648351	2.1426475	2.2232236	2.3061011	2.3908969	2.4772998	2.5650595	2.6539747	2.7438831	.70		
.71	1.9451138	2.0161206	2.0909953	2.1691265	2.2499756	2.3330856	2.4180795	2.5024651	2.5925575	2.6815993	2.7716182	.71		
.72	1.9709753	2.0423982	2.1176389	2.1960866	2.2772063	2.3605466	2.4457368	2.5324773	2.6205277	2.7096952	2.7998241	.72		
.73	1.9973629	2.0692005	2.1448053	2.2235672	2.3049553	2.3885241	2.4739091	2.5608164	2.6490106	2.7383032	2.8285415	.73		
.74	2.0243193	2.0965706	2.1725379	2.2516120	2.3323665	2.4170621	2.5026405	2.5897135	2.6780509	2.7674679	2.8578152	.74		
.75	2.0518916	2.1245561	2.2008844	2.2802690	2.3621884	2.4462094	2.5319800	2.6192179	2.7076977	2.7972387	2.8876949	.75		
.76	2.0801325	2.1523100	2.2298982	2.3095920	2.3917748	2.4760200	2.5619818	2.6493840	2.7380058	2.8276705	2.9182353	.76		
.77	2.1091008	2.1825913	2.2596388	2.3396406	2.4220859	2.5065542	2.5927067	2.6802726	2.7690361	2.8588244	2.9494978	.77		
.78	2.1388626	2.2127666	2.2901730	2.3704822	2.4531890	2.5378799	2.6242225	2.7119519	2.8008571	2.8907690	2.9815512	.78		
.79	2.1694924	2.2438110	2.3215763	2.4021925	2.4851605	2.5700736	2.6566061	2.7444989	2.8335458	2.9235817	3.0144729	.79		
.80	2.2010753	2.2758099	2.3539346	2.4348578	2.5180868	2.6032221	2.6899446	2.7780010	2.8671900	2.9573502	3.0483509	.80		
.81	2.2337084	2.3088609	2.3873460	2.4685767	2.5520670	2.6374247	2.7243376	2.8125582	2.9018898	2.9921749	3.0832857	.81		
.82	2.2675036	2.3430767	2.4219237	2.5034628	2.5872151	2.6727960	2.7599000	2.8482855	2.9377605	3.0281713	3.1193932	.82		
.83	2.3025911	2.3785880	2.4577991	2.5396480	2.6236635	2.7094686	2.7967648	2.8853163	2.9749359	3.0654736	3.1568076	.83		
.84	2.3391233	2.4155482	2.4951262	2.5772870	2.6615675	2.7475983	2.8350882	2.9238072	3.0135728	3.1042387	3.1956862	.84		
.85	2.3772808	2.4541388	2.5340871	2.6165627	2.7011103	2.7873691	2.8750546	2.9639430	3.0538565	3.1446524	3.2362149	.85		
.86	2.4172796	2.4945766	2.5748999	2.6576937	2.7425117	2.8290010	2.9168848	3.0059450	3.0960085	3.1869366	3.2786162	.86		
.87	2.4593812	2.5371247	2.6178285	2.7009451	2.7860372	2.8727606	2.9608458	3.0500807	3.1402971	3.2313599	3.3231591	.87		
.88	2.5039071	2.5821059	2.6631973	2.7466423	2.8320134	2.9189753	3.0072658	3.0966791	3.1870518	3.2782525	3.3701741	.88		
.89	2.5512588	2.6299238	2.7114111	2.7951917	2.8808478	2.9680535	3.0565543	3.1461506	3.2366836	3.3280260	3.4200736	.89		
.90	2.6019474	2.6810916	2.7629855	2.8471103	2.9330591	3.0205153	3.1092325	3.1990172	3.2897157	3.3812044	3.4733823	.90		
.91	2.6566382	2.7362778	2.8185912	2.9030712	2.9893222	3.0770374	3.1659785	3.2559585	3.3468288	3.4384697	3.5307830	.91		
.92	2.7162215	2.7963766	2.8791260	2.9639750	3.0505401	3.1385249	3.2276995	3.3178834	3.4089334	3.5007334	3.5931888	.92		
.93	2.7819292	2.8626250	2.9458313	3.0310671	3.1179617	3.2062297	3.2956499	3.3860488	3.4772883	3.5692566	3.6618624	.93		
.94	2.8555391	2.9368086	3.0204989	3.1061446	3.1933889	3.2819580	3.3716397	3.4622679	3.5537099	3.6458583	3.7386250	.94		
.95	2.9397626	3.0216498	3.1058609	3.1919479	3.2795691	3.3684632	3.4584280	3.5493047	3.6409666	3.7333108	3.8262529	.95		
.96	3.0309568	3.1216236	3.2064075	3.2929801	3.3810168	3.4702701	3.5605483	3.6517007	3.7436607	3.8361693	3.9293071	.96		
.97	3.1615919	3.2449317	3.3303669	3.4174926	3.5060037	3.5956680	3.6863057	3.7777752	3.8699632	3.9627774	4.0561414	.97		
.98	3.3251960	3.4094684	3.4956897	3.5834843	3.6725709	3.7627354	3.8538119	3.9456696	4.0382033	4.1313272	4.2249700	.98		
.99	3.5844940	3.6700480	3.7573517	3.8460708	3.9359560	4.0268178	4.1185086	4.2109117	4.3039327	4.3974944	4.4915326	.99		

$P \backslash d$	$R = R(P, d)$ where probability $P = P(R, d)$, $\bar{R} = R * u$, $\bar{d} = d * u$										2.9	3.0	d/P
	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8				
.01	0.3778935	0.4154950	0.4578902	0.5053737	0.5581151	0.6161205	0.6792140	0.7470489	0.8191502	0.8949739	0.9739684	.01	
.02	0.5265225	0.5755282	0.6296252	0.6887771	0.7527860	0.8213074	0.8938884	0.9700205	1.0491916	1.1309256	1.2148056	.02	
.03	0.6364337	0.6924086	0.7532909	0.8188381	0.8886805	0.9623614	1.0393867	1.1192705	1.2015675	1.2858908	1.3719160	.03	
.04	0.7263118	0.7871285	0.8525582	0.9222432	0.9957414	1.0725726	1.1522618	1.2343712	1.3185180	1.4043797	1.4916904	.04	
.05	0.8034918	0.8679130	0.9366416	1.0092588	1.0852984	1.1642896	1.2457093	1.3294117	1.4148180	1.5017335	1.5899320	.05	
.06	0.8717623	0.9389914	1.0102409	1.0850629	1.1629906	1.2435748	1.3264091	1.4111427	1.4974804	1.5851802	1.6740440	.06	
.07	0.9333800	1.0028691	1.0761185	1.1526698	1.2320670	1.3138866	1.3977546	1.4833531	1.5704184	1.6587340	1.7481234	.07	
.08	0.9898149	1.0611691	1.1360506	1.2140019	1.2945832	1.3773966	1.4620970	1.5483946	1.6360503	1.7248683	1.8146886	.08	
.09	1.0420858	1.1150099	1.1912536	1.2703666	1.3519277	1.4355632	1.5209536	1.6078327	1.6959815	1.7852210	1.8754043	.09	
.10	1.0909313	1.1651986	1.2426001	1.3226964	1.4050855	1.4894163	1.5753915	1.6627651	1.7513350	1.8409357	1.9314314	.10	
.11	1.1369066	1.2123386	1.2907390	1.3716812	1.4547823	1.5397115	1.6261916	1.7139933	1.8029290	1.8928447	1.9836136	.11	
.12	1.1804405	1.2568943	1.3361673	1.4178473	1.5015692	1.5870213	1.6739433	1.7621212	1.8513793	1.9415735	2.0325847	.12	
.13	1.2218720	1.2992309	1.3792747	1.4616055	1.5458755	1.6317899	1.7191037	1.8076159	1.8971616	1.9876049	2.0788333	.13	
.14	1.2614744	1.3396421	1.4203730	1.5032837	1.5880424	1.6743697	1.7620345	1.8508470	1.9406516	2.0313198	2.1227449	.14	
.15	1.2994714	1.3783672	1.4597156	1.5431475	1.6283458	1.7150454	1.8030273	1.8921119	1.9821517	2.0730246	2.1646291	.15	
.16	1.3360489	1.4156047	1.4975121	1.5814158	1.6670127	1.7540504	1.8423211	1.9316540	2.0219089	2.1129695	2.2047389	.16	
.17	1.3713632	1.4515207	1.5339375	1.6182712	1.7042319	1.7915789	1.8801141	1.9696752	2.0601282	2.1513620	2.2432837	.17	
.18	1.4055473	1.4862563	1.5691398	1.6538677	1.7401625	1.8277939	1.9165732	2.0063450	2.0969814	2.1883758	2.2804391	.18	
.19	1.4387151	1.5199322	1.6032454	1.6883368	1.7749399	1.8628345	1.9518398	2.0418074	2.1326144	2.2241585	2.3163540	.19	
.20	1.4709655	1.5526526	1.6363635	1.7217914	1.8086804	1.8968195	1.9860354	2.0761856	2.1671520	2.2588364	2.3511557	.20	
.21	1.5023846	1.5845084	1.6685887	1.7543296	1.8414850	1.9298523	2.0192650	2.1095862	2.2007023	2.2925183	2.3849541	.21	
.22	1.5330483	1.6155791	1.7000039	1.7860371	1.8734416	1.9620227	2.0516202	2.1421021	2.2333591	2.3252992	2.4178452	.22	
.23	1.5630235	1.6459351	1.7300624	1.8169894	1.9046278	1.9933408	2.0831812	2.1738148	2.2652049	2.3572625	2.4499127	.23	
.24	1.5923699	1.6756389	1.7606890	1.8472535	1.9351120	2.0240835	2.1140193	2.2047964	2.2963125	2.3884815	2.4812307	.24	
.25	1.6211411	1.7047463	1.7900816	1.8768889	1.9649553	2.0541060	2.1441975	2.2351108	2.3267466	2.4190217	2.5118651	.25	
.26	1.6493851	1.7333077	1.8189123	1.9059491	1.9942123	2.0835331	2.1737725	2.2648152	2.3565652	2.4489413	2.5418747	.26	
.27	1.6771456	1.7613683	1.8472279	1.9344823	2.0229325	2.1124149	2.2027951	2.2939613	2.3858202	2.4782929	2.5713124	.27	
.28	1.7044620	1.7889694	1.8750710	1.9625322	2.0511602	2.1407967	2.2313113	2.3225955	2.4145585	2.5071238	2.6002258	.28	
.29	1.7313707	1.8161486	1.9024804	1.9901385	2.0789361	2.1687198	2.2593629	2.3507600	2.4428230	2.5354770	2.6286582	.29	
.30	1.7579048	1.8429402	1.9294915	2.0173376	2.1062973	2.1962218	2.2869880	2.3784936	2.4706524	2.5633917	2.6566492	.30	
.31	1.7840950	1.8693762	1.9561370	2.0441628	2.1332778	2.2233373	2.3142217	2.4058314	2.4980825	2.5909040	2.6842350	.31	
.32	1.8099696	1.8954857	1.9824470	2.0706450	2.1599089	2.2500981	2.3410962	2.4328061	2.5251462	2.6180469	2.7114488	.32	
.33	1.8355549	1.9212960	2.0084494	2.0968127	2.1862197	2.2765336	2.3676412	2.4594478	2.5518737	2.6448510	2.7383214	.33	
.34	1.8608757	1.9468324	2.0341704	2.1226926	2.2122372	2.3026714	2.3938846	2.4857846	2.5782934	2.6713446	2.7648815	.34	
.35	1.8859549	1.9721189	2.0596343	2.1483093	2.2379867	2.3285369	2.4198521	2.5118424	2.6044314	2.6975544	2.7911556	.35	
.36	1.9108143	1.9971775	2.0848638	2.1736863	2.2634918	2.3541541	2.4455080	2.5376457	2.6303125	2.7235051	2.8171687	.36	
.37	1.9354743	2.0220296	2.1098806	2.1988455	2.2887748	2.3795456	2.4710551	2.5632175	2.6559598	2.7492199	2.8429443	.37	
.38	1.9599545	2.0466949	2.1347051	2.2238075	2.3138568	2.4047326	2.4963349	2.5885795	2.6813952	2.7747209	2.8685043	.38	
.39	1.9842732	2.0711926	2.1593566	2.2485923	2.3387577	2.4297354	2.5214277	2.6137523	2.7066393	2.8000289	2.8938698	.39	
.40	2.0084484	2.0955407	2.1838537	2.2732184	2.3634965	2.4545733	2.5463531	2.6387554	2.7317118	2.8251637	2.9190606	.40	
.41	2.0324968	2.1197567	2.2082140	2.2977040	2.3880916	2.4792646	2.5711296	2.6636076	2.7566317	2.8501443	2.9440959	.41	
.42	2.0564351	2.1438573	2.2324547	2.3220664	2.4125604	2.5038271	2.5957750	2.6883269	2.7814170	2.8749889	2.9689939	.42	
.43	2.0802790	2.1678588	2.2565922	2.3463222	2.4369198	2.5282778	2.6203066	2.7129305	2.8060851	2.8997149	2.9937722	.43	
.44	2.1040439	2.1917768	2.2806425	2.3704877	2.4611862	2.5526332	2.6447044	2.7374353	2.8306529	2.9243393	3.0184477	.44	
.45	2.1277450	2.2156267	2.3046212	2.3945786	2.4853756	2.5769095	2.6690944	2.7618755	2.8551367	2.9488786	3.0430371	.45	
.46	2.1513969	2.2394235	2.3284535	2.4186104	2.5095034	2.6011223	2.6933826	2.7862131	2.8795526	2.9733489	3.0675564	.46	
.47	2.1750143	2.2631820	2.3524244	2.4425981	2.5335851	2.6252870	2.7176312	2.8105175	2.9039162	2.9977658	3.0920215	.47	
.48	2.1986115	2.2869169	2.3762787	2.4665568	2.5576357	2.6494188	2.7418253	2.8347863	2.9282430	3.0221448	3.1164478	.48	
.49	2.2222028	2.3106425	2.4001210	2.4905013	2.5816700	2.6735328	2.7660102	2.8590346	2.9525483	3.0465014	3.1408508	.49	
.50	2.2458023	2.3343732	2.4239659	2.5144461	2.6057030	2.6976338	2.7901907	2.8832774	2.9768470	3.0708507	3.1652458	.50	

$P \backslash d$	$R = P(R, d)$ where probability $P = P(R, d)$, $\bar{R} = R * u$, $\bar{d} = d * u$										2.9	3.0	d/P
	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	d/P	
.50	2.2458023	2.3343732	2.4239659	2.5144461	2.6057030	2.6976438	2.7901907	2.8832774	2.9768470	3.0708507	3.1652458	.50	
.51	2.2694243	2.3581236	2.4478280	2.5384062	2.6297493	2.7217668	2.8143820	2.9075298	3.0011545	3.0952078	3.1896479	.51	
.52	2.2930831	2.3819080	2.4717219	2.5623960	2.6538240	2.7459167	2.8385990	2.9318070	3.0254857	3.1195879	3.2140723	.52	
.53	2.3167931	2.4057412	2.4956623	2.5864307	2.6779418	2.7701085	2.8628568	2.9561240	3.0498560	3.1440063	3.2385344	.53	
.54	2.3405691	2.4296378	2.5196642	2.6105251	2.7021181	2.7943574	2.8871707	2.9804962	3.0742807	3.1684785	3.2630496	.54	
.55	2.3644259	2.4536129	2.5437428	2.6346946	2.7263680	2.8186789	2.9115562	3.0049391	3.0987755	3.1930201	3.2876337	.55	
.56	2.3883788	2.4776820	2.5679135	2.6589547	2.7507074	2.8430888	2.9360292	3.0294687	3.1233562	3.2176471	3.3123027	.56	
.57	2.4124435	2.5018608	2.5921922	2.6833215	2.7751522	2.8676032	2.9606057	3.0541012	3.1480391	3.2423757	3.3370728	.57	
.58	2.4366360	2.5261656	2.6165954	2.7078114	2.7997190	2.8922386	2.9853026	3.0788533	3.1728411	3.2672228	3.3619610	.58	
.59	2.4609730	2.5506132	2.6411399	2.7324415	2.8244250	2.9170122	3.0101369	3.1037422	3.1977793	3.2922058	3.3869846	.59	
.60	2.4854720	2.5752211	2.6658433	2.7572293	2.8492877	2.9419418	3.0351265	3.1287858	3.2228717	3.3173424	3.4121615	.60	
.61	2.5101511	2.6000075	2.6907239	2.7821932	2.8743257	2.9670460	3.0602900	3.1540028	3.2481370	3.3426516	3.4375106	.61	
.62	2.5350291	2.6249914	2.7158009	2.8073525	2.8995582	2.9923440	3.0856467	3.1794125	3.2735947	3.3681527	3.4630513	.62	
.63	2.5601261	2.6501929	2.7410944	2.8327274	2.9250056	3.0178561	3.1112171	3.2050354	3.2992651	3.3938663	3.4888043	.63	
.64	2.5854630	2.6756331	2.7666256	2.8583392	2.9506891	3.0436039	3.1370227	3.2308931	3.3251699	3.4198140	3.5147910	.64	
.65	2.6110622	2.7013345	2.7924170	2.8842104	2.9766315	3.0696100	3.1630860	3.2570081	3.3513319	3.4460186	3.5410344	.65	
.66	2.6369474	2.7273208	2.8184925	2.9103650	3.0028567	3.0958984	3.1894314	3.2834049	3.3777752	3.4725043	3.5675587	.66	
.67	2.6631439	2.7536175	2.8448776	2.9368286	3.0293903	3.1224949	3.2160844	3.3101090	3.4045257	3.4992969	3.5943899	.67	
.68	2.6896788	2.7802517	2.8715995	2.9636285	3.0562598	3.1494269	3.2430726	3.3371482	3.4316110	3.5264243	3.6215555	.68	
.69	2.7163813	2.8072528	2.8986878	2.9907942	3.0834948	3.1767240	3.2704257	3.3645520	3.4590608	3.5539160	3.6490855	.69	
.70	2.7438831	2.8346524	2.9261740	3.0183575	3.1111270	3.2044181	3.2981757	3.3923525	3.4869072	3.5818042	3.6770119	.70	
.71	2.7716182	2.8624849	2.9540926	3.0463529	3.1391910	3.2325438	3.3263572	3.4205844	3.5151850	3.6101237	3.7053696	.71	
.72	2.7998241	2.8907876	2.9824812	3.0748179	3.1677245	3.2611389	3.3550078	3.4492854	3.5439318	3.6389123	3.7341964	.72	
.73	2.8285415	2.9196014	3.0113806	3.1037936	3.1967686	3.2902445	3.3841690	3.4783497	3.5731892	3.6682115	3.7635339	.73	
.74	2.8578152	2.9489714	3.0408359	3.1333251	3.2263684	3.3199059	3.4138860	3.5082644	3.6030025	3.6980667	3.7934274	.74	
.75	2.8876949	2.9789470	3.0708969	3.1634623	3.2565740	3.3501730	3.4442088	3.5386377	3.6334218	3.7285280	3.8239272	.75	
.76	2.9182353	3.0095835	3.1016187	3.1942603	3.2874405	3.3811012	3.4751928	3.5696725	3.6645028	3.7596512	3.8550890	.76	
.77	2.9494978	3.0409421	3.1330628	3.2257808	3.3190296	3.4127523	3.5069000	3.6014306	3.6963073	3.7914982	3.8869748	.77	
.78	2.9815512	3.0730917	3.1652981	3.2580929	3.3514106	3.4451955	3.5393996	3.6339815	3.7289049	3.8241384	3.9196543	.78	
.79	3.0144729	3.1061100	3.1984025	3.2912744	3.3846614	3.4785090	3.5727698	3.6674033	3.7623738	3.8576504	3.9532058	.79	
.80	3.0483509	3.1400851	3.2324642	3.3254136	3.4188706	3.5127812	3.6070994	3.7017849	3.7968030	3.8921231	3.9877183	.80	
.81	3.0832857	3.1751177	3.2675840	3.3606118	3.4541392	3.5481136	3.6424895	3.7372277	3.8322938	3.9276579	4.0232936	.81	
.82	3.1193932	3.2113238	3.3038782	3.3969849	3.4905836	3.5846224	3.6790569	3.7738484	3.8689632	3.9643719	4.0600486	.82	
.83	3.1568076	3.2488379	3.3414813	3.4346681	3.5283389	3.6224431	3.7169369	3.8117824	3.9069467	4.0024007	4.0981190	.83	
.84	3.1956862	3.2878174	3.3805512	3.4738191	3.5675632	3.6617337	3.7562878	3.8511884	3.9464030	4.0419031	4.1376638	.84	
.85	3.2362149	3.3284487	3.4212742	3.5146247	3.6084433	3.7026814	3.7972970	3.8922537	3.9875196	4.0830668	4.1788708	.85	
.86	3.2786162	3.3709543	3.4638734	3.5573081	3.6512028	3.7455100	3.8401884	3.9352024	4.0305208	4.1261162	4.2219645	.86	
.87	3.3231591	3.4156039	3.5086186	3.6021395	3.6961121	3.7904899	3.8852328	3.9803056	4.0756779	4.1713228	4.2672166	.87	
.88	3.3701741	3.4627282	3.5558411	3.6494504	3.7435032	3.8379538	3.9327629	4.0278963	4.1233241	4.2190200	4.3149609	.88	
.89	3.4200736	3.5127403	3.6059544	3.6996550	3.7937904	3.8883161	3.9831938	4.0783899	4.1738751	4.2696239	4.3656135	.89	
.90	3.4733823	3.5661656	3.6594845	3.7532797	3.8475009	3.9421047	4.0375036	4.1323148	4.2278599	4.3236637	4.4197040	.90	
.91	3.5307830	3.6236877	3.7171159	3.8110099	3.9053207	4.0000060	4.0950293	4.1903588	4.2859665	4.3818279	4.4779214	.91	
.92	3.5931888	3.6862209	3.7797639	3.8737617	3.9681667	4.0629380	4.1580397	4.2534411	4.3491149	4.4450372	4.5411868	.92	
.93	3.6618624	3.7550294	3.8486941	3.9428021	4.0373073	4.1321698	4.2273551	4.3228331	4.4185773	4.5145645	4.6107741	.93	
.94	3.7386250	3.8319368	3.9257321	4.0199586	4.1145716	4.2095324	4.3048077	4.4003683	4.4961885	4.5922458	4.6885203	.94	
.95	3.8262529	3.9197226	4.0136606	4.1080166	4.2027474	4.2978160	4.3931899	4.4888411	4.5847449	4.6808793	4.7772250	.95	
.96	3.9293071	4.0229531	4.1170506	4.2115515	4.3064145	4.4016039	4.4970888	4.5928419	4.6888396	4.7850608	4.8814869	.96	
.97	4.0561414	4.1499916	4.2442743	4.3389437	4.4339604	4.5292906	4.6249047	4.7207768	4.8168843	4.9132071	5.0097274	.97	
.98	4.2249700	4.3190725	4.4135842	4.5084623	4.6036699	4.6991751	4.7949500	4.8909705	4.9872151	5.0836648	5.1803029	.98	
.99	4.4915326	4.5859936	4.6808316	4.7760077	4.8714883	4.9672444	5.0632505	5.1594844	5.2559266	5.3525597	5.4493683	.99	

$P \backslash d$	3.0	3.1	3.2	3.3	3.4	3.5	$\bar{R} = R * u,$	3.6	3.7	3.8	3.9	4.0	d/P
.01	0.9739684	1.0556213	1.1394857	1.2251888	1.3124275	1.4009589	1.4905582	1.5811588	1.6725435	1.7646380	1.8573554	.01	
.02	1.2148056	1.3004809	1.3876641	1.4761229	1.5656698	1.6561527	1.7474477	1.8394525	1.9320816	2.0252632	2.1189365	.02	
.03	1.3719160	1.4593771	1.5480584	1.6377848	1.7284140	1.8198291	1.9119330	2.0046445	2.0978951	2.1916262	2.2857878	.03	
.04	1.4916904	1.5802337	1.6698337	1.7603470	1.8516556	1.9436615	2.0362828	2.1294502	2.2231044	2.3171948	2.4116774	.04	
.05	1.5899320	1.6792294	1.7694753	1.8605463	1.9523399	2.0447707	2.1377662	2.2312650	2.3252141	2.4195682	2.5142875	.05	
.06	1.6740440	1.7639104	1.8546470	1.9461442	2.0383108	2.1310696	2.2243555	2.3181124	2.4122922	2.5068531	2.6017586	.06	
.07	1.7481234	1.8384419	1.9295705	2.0214099	2.1138770	2.2069014	2.3004230	2.3943903	2.4887585	2.5834889	2.6785474	.07	
.08	1.8146886	1.9053796	1.9968324	2.0889560	2.1816736	2.2749200	2.3686394	2.4627836	2.5573106	2.6521841	2.7473721	.08	
.09	1.8754043	1.9664103	2.0581384	2.1505041	2.2434358	2.3368724	2.4307616	2.5250580	2.6197220	2.7147192	2.8100193	.09	
.10	1.9314314	2.0227094	2.1146760	2.2072519	2.3003700	2.3939727	2.4880104	2.5824401	2.6772244	2.7723304	2.8677292	.10	
.11	1.9836136	2.0751304	2.1673068	2.2600682	2.3533510	2.4471008	2.5412703	2.6358186	2.7307100	2.8259130	2.9214000	.11	
.12	2.0325847	2.1243137	2.2166771	2.3096042	2.4030345	2.4969161	2.5912040	2.6858589	2.7808468	2.8761373	2.9717039	.12	
.13	2.0788333	2.1707531	2.2632849	2.3563615	2.4499251	2.5439261	2.6383214	2.7330732	2.8281488	2.9235189	3.0191581	.13	
.14	2.1227449	2.2148377	2.3075226	2.4007353	2.4944205	2.5885305	2.6830240	2.7778645	2.8730205	2.9684637	3.0641696	.14	
.15	2.1646291	2.2568801	2.3497052	2.4430427	2.5368396	2.6310500	2.7256338	2.8205562	2.9157863	3.0112972	3.1070646	.15	
.16	2.2047389	2.2971355	2.3900898	2.4835426	2.5774428	2.6717460	2.7664136	2.8614118	2.9567109	3.0522845	3.1481094	.16	
.17	2.2432837	2.3358150	2.4288892	2.5224490	2.6164452	2.7108348	2.8055805	2.9006495	2.9960129	3.0916452	3.1875236	.17	
.18	2.2804391	2.3730959	2.4662817	2.5599414	2.6540272	2.7484976	2.8433164	2.9384517	3.0338754	3.1295628	3.2254916	.18	
.19	2.3163540	2.4091280	2.5024183	2.5961716	2.6903415	2.7848878	2.8797753	2.9749730	3.0704535	3.1661927	3.2621691	.19	
.20	2.3511557	2.4440397	2.5374283	2.6312696	2.7255187	2.8201366	2.9150889	3.0103455	3.1058797	3.2016680	3.2976893	.20	
.21	2.3849541	2.4779419	2.5714231	2.6653475	2.7596716	2.8543571	2.9493708	3.0446832	3.1402683	3.2361032	3.3321672	.21	
.22	2.4178452	2.5109309	2.6044998	2.6985030	2.7928980	2.8876478	2.9827197	3.0780852	3.1737187	3.2695979	3.3657026	.22	
.23	2.4499127	2.5430913	2.6367434	2.7308214	2.8252840	2.9200948	3.0152223	3.1106383	3.2063180	3.3022395	3.3983830	.23	
.24	2.4812307	2.5744977	2.6682290	2.7623783	2.8569052	2.9517744	3.0469548	3.1424191	3.2381430	3.3341049	3.4302855	.24	
.25	2.5118651	2.6052164	2.6990232	2.7932406	2.8878290	2.9827539	3.0779850	3.1734956	3.2692618	3.3652625	3.4614788	.25	
.26	2.5418747	2.6353065	2.7291856	2.8234680	2.9181153	3.0130937	3.1083735	3.2039285	3.2997353	3.3957732	3.4920237	.26	
.27	2.5713124	2.6648211	2.7587695	2.8531144	2.9478183	3.0428480	3.1381745	3.2337721	3.3296180	3.4256918	3.5219754	.27	
.28	2.6002258	2.6938085	2.7878233	2.8822283	2.9769864	3.0720656	3.1674371	3.2630758	3.3589594	3.4550678	3.5513832	.28	
.29	2.6286582	2.7223120	2.8163908	2.9108535	3.0056641	3.1007908	3.1962057	3.2918842	3.3878041	3.4839459	3.5802920	.29	
.30	2.6566492	2.7503714	2.8445119	2.9390303	3.0338914	3.1290641	3.2245209	3.3202377	3.4161928	3.5123670	3.6087429	.30	
.31	2.6842350	2.7780231	2.8722231	2.9667954	3.0617053	3.1569224	3.2524198	3.3481738	3.4441629	3.5403684	3.6367732	.31	
.32	2.7114488	2.8053007	2.8995582	2.9941825	3.0891397	3.1843998	3.2799366	3.3757265	3.4717487	3.5679846	3.6644174	.32	
.33	2.7383214	2.8322350	2.9265482	3.0212229	3.1162259	3.2115278	3.3071027	3.4029276	3.4989819	3.5952473	3.6917073	.33	
.34	2.7648815	2.8588548	2.9532220	3.0479456	3.1429930	3.2383355	3.3339474	3.4298063	3.5258918	3.6221859	3.7186725	.34	
.35	2.7911556	2.8851869	2.9796064	3.0743775	3.1694682	3.2648500	3.3604980	3.4563899	3.5525058	3.6488279	3.7453403	.35	
.36	2.8171687	2.9112563	3.0057267	3.1005440	3.1956767	3.2910969	3.3867800	3.4827041	3.5788495	3.6751989	3.7717365	.36	
.37	2.8429443	2.9370865	3.0316064	3.1264687	3.2216423	3.3170999	3.4128172	3.5087727	3.6049470	3.7013231	3.7978853	.37	
.38	2.8685043	2.9626998	3.0572680	3.1521740	3.2473876	3.3428816	3.4386323	3.5346184	3.6308210	3.7272231	3.8238093	.38	
.39	2.8938698	2.9881172	3.0827324	3.1776812	3.2729337	3.3684633	3.4642466	3.5602627	3.6564929	3.7529204	3.8495302	.39	
.40	2.9190606	3.0133587	3.1080198	3.2030103	3.2983009	3.3938653	3.4896805	3.5857259	3.6819831	3.7784355	3.8750683	.40	
.41	2.9440959	3.0384435	3.1331494	3.2281807	3.3235084	3.4191069	3.5149534	3.6110275	3.7073111	3.8037879	3.9004433	.41	
.42	2.9689939	3.0633898	3.1581395	3.2532108	3.3485749	3.4442068	3.5400838	3.6361860	3.7324956	3.8289963	3.9256739	.42	
.43	2.9937722	3.0882153	3.1830079	3.2781183	3.3735181	3.4691827	3.5650897	3.6612195	3.7575545	3.8540788	3.9507781	.43	
.44	3.0184477	3.1129371	3.2077718	3.3029205	3.3983553	3.4940519	3.5898883	3.6861453	3.7825052	3.8790526	3.9757733	.44	
.45	3.0430371	3.1375718	3.2324478	3.3276340	3.4231032	3.5188312	3.6147966	3.7109801	3.8073646	3.9039347	4.0006765	.45	
.46	3.0675564	3.1621356	3.2570520	3.3522751	3.4477781	3.5435370	3.6395308	3.7357405	3.8321491	3.9287416	4.0255040	.46	
.47	3.0920215	3.1866444	3.2816005	3.3768598	3.4723959	3.5681853	3.6642070	3.7604425	3.8568749	3.9534893	4.0502722	.47	
.48	3.1164478	3.2111137	3.3061088	3.4014038	3.4969725	3.5927918	3.6888410	3.7851018	3.8815577	3.9781938	4.0749967	.48	
.49	3.1408508	3.2355589	3.3305924	3.4259225	3.5215233	3.6173720	3.7134484	3.8097342	3.9062131	4.0028706	4.0996934	.49	
.50	3.1652458	3.2599953	3.3550667	3.4504313	3.5460637	3.6419415	3.7380446	3.8343550	3.9308567	4.0275353	4.1243777	.50	

$P \backslash d$	3.0	3.1	3.2	3.3	3.4	3.5	$\bar{R} = R * u$,	3.6	3.7	3.8	3.9	4.0	d/P
.50	3.1652458	3.2599953	3.350667	3.4504313	3.5460637	3.6419415	3.7380446	3.8343550	3.9308567	4.0275353	4.1243777	.50	
.51	3.1896479	3.2844382	3.3795469	3.4749455	3.5706091	3.6665155	3.7626450	3.8589797	3.9555040	4.0522034	4.1490651	.51	
.52	3.2140723	3.3089029	3.4040483	3.4994805	3.5951749	3.6911095	3.7872650	3.8836328	3.9801703	4.0768903	4.1737711	.52	
.53	3.2385344	3.3334048	3.4285863	3.5240516	3.6197764	3.7157390	3.8119202	3.9083027	4.0048712	4.1016115	4.1985112	.53	
.54	3.2630496	3.3579592	3.4531765	3.5486745	3.6444293	3.7404195	3.8366262	3.9330322	4.0296223	4.1263828	4.2233013	.54	
.55	3.2876337	3.3825820	3.4778346	3.5733650	3.6691494	3.7651669	3.8613987	3.9578280	4.0544397	4.1512201	4.2481571	.55	
.56	3.3123027	3.4072892	3.5025767	3.5981391	3.6939529	3.7899974	3.8862541	3.9827064	4.0793394	4.1761396	4.2730950	.56	
.57	3.3370728	3.4320971	3.5274192	3.6230132	3.7188561	3.8149274	3.9112088	4.0076839	4.1043380	4.2011579	4.2981315	.57	
.58	3.3619610	3.4570227	3.5523791	3.6480044	3.7438761	3.8399739	3.9362797	4.0327775	4.1294526	4.2262919	4.3232836	.58	
.59	3.3869846	3.4820834	3.5774736	3.6731300	3.7690302	3.8651543	3.9614845	4.0580047	4.1547006	4.2515592	4.3485689	.59	
.60	3.4121615	3.5072971	3.6027209	3.6984081	3.7943367	3.8904869	3.9868411	4.0833836	4.1801002	4.2769780	4.3740056	.60	
.61	3.4375106	3.5326825	3.6281397	3.7238575	3.8198142	3.9159903	4.0123685	4.1089332	4.2056703	4.3025673	4.3996126	.61	
.62	3.4630513	3.5582594	3.6537497	3.7494979	3.8454825	3.9416844	4.0380864	4.1346731	4.2314307	4.3283467	4.4254097	.62	
.63	3.4888043	3.5840483	3.6795714	3.7753498	3.8713622	3.9675898	4.0640155	4.1606241	4.2574021	4.3543369	4.4514176	.63	
.64	3.5147910	3.6100707	3.7056265	3.8014349	3.8974750	3.9937281	4.0901774	4.1868079	4.2836061	4.3805599	4.4776580	.64	
.65	3.5410344	3.6363496	3.7319380	3.8277763	3.9238439	4.0201224	4.1165952	4.2132475	4.3100659	4.4070385	4.5041542	.65	
.66	3.5675587	3.6629092	3.7585300	3.8543982	3.9504932	4.0467970	4.1432933	4.2399673	4.3368059	4.4337973	4.5309305	.66	
.67	3.5943899	3.6897756	3.7854287	3.8813265	3.9774490	4.0737780	4.1702977	4.2669934	4.3638522	4.4608623	4.5580130	.67	
.68	3.6215555	3.7169764	3.8126617	3.9085892	4.0047389	4.1010932	4.1976362	4.2943536	4.3912326	4.4882614	4.5854296	.68	
.69	3.6490855	3.7445414	3.8402589	3.9362159	4.0323930	4.1287725	4.2253389	4.3220780	4.4189771	4.5160247	4.6132103	.69	
.70	3.6770119	3.7725028	3.8682524	3.9642391	4.0604434	4.1568482	4.2534379	4.3501987	4.4471180	4.5441844	4.6413876	.70	
.71	3.7053696	3.8008955	3.8966772	3.9926935	4.0889251	4.1853552	4.2819683	4.3787509	4.4756903	4.5727755	4.6699963	.71	
.72	3.7341964	3.8297573	3.9255713	4.0216171	4.1178762	4.2143315	4.3109682	4.4077725	4.5047322	4.6018363	4.6990747	.72	
.73	3.7635339	3.8591298	3.9549760	4.0510516	4.1473381	4.2438188	4.3404790	4.4373052	4.5342853	4.6314084	4.7286645	.73	
.74	3.7934274	3.8890585	3.9849370	4.0810425	4.1773565	4.2738627	4.3705466	4.4673947	4.5643953	4.6615375	4.7588114	.74	
.75	3.8239272	3.9195936	4.0155047	4.1116400	4.2079817	4.3045137	4.4012213	4.4980916	4.5951127	4.6922741	4.7895660	.75	
.76	3.8550890	3.9507909	4.0467346	4.1429001	4.2392697	4.3358274	4.4325590	4.5294516	4.6264935	4.7236742	4.8209842	.76	
.77	3.8869748	3.9827125	4.0786890	4.1748849	4.2712826	4.3678663	4.4646220	4.5615371	4.6585999	4.7558002	4.8531284	.77	
.78	3.9196543	4.0154279	4.1114377	4.2076641	4.3040901	4.4007001	4.4974802	4.5944179	4.6915019	4.7887219	4.8860686	.78	
.79	3.9532058	4.0490158	4.1450590	4.2413163	4.3377709	4.4344075	4.5312122	4.6281729	4.7252783	4.8225182	4.9198836	.79	
.80	3.9871783	4.0835650	4.1796421	4.2759307	4.3724143	4.4690777	4.5659074	4.6628913	4.7600184	4.8572786	4.9546629	.80	
.81	4.0232936	4.1191775	4.2152888	4.3116092	4.4081221	4.5048127	4.6016678	4.6986107	4.7958243	4.8931051	4.9905086	.81	
.82	4.0600486	4.1559701	4.2521163	4.3484688	4.4450115	4.5417299	4.6386107	4.7356421	4.8328136	4.9301153	5.0275384	.82	
.83	4.0981190	4.1940789	4.2902605	4.3866457	4.4832188	4.5799653	4.6768723	4.7739282	4.8711225	4.9684455	5.0658886	.83	
.84	4.1376638	4.2336628	4.3298804	4.4262991	4.5229031	4.6196784	4.7166122	4.8136930	4.9109106	5.0082554	5.1057189	.84	
.85	4.1788708	4.2749097	4.3711642	4.4676170	4.5642527	4.6610574	4.7580186	4.8551250	4.9523664	5.0497336	5.1472180	.85	
.86	4.2219645	4.3180443	4.4143366	4.5108244	4.6074926	4.7043275	4.8013168	4.8984495	4.9957155	5.0931056	5.1906115	.86	
.87	4.2672166	4.3633385	4.4596697	4.5561935	4.6528952	4.7497612	4.8467795	4.9439393	5.0412305	5.1386443	5.2361724	.87	
.88	4.3149609	4.4111261	4.5074974	4.6040585	4.7007947	4.7976929	4.8947412	4.9919290	5.0892464	5.1866847	5.2842358	.88	
.89	4.3656135	4.4618237	4.5582367	4.6548364	4.7516085	4.8485401	4.9456195	5.0429363	5.1401810	5.2376448	5.3352198	.89	
.90	4.4177040	4.5159611	4.6124175	4.7090575	4.8058670	4.9028335	4.9999455	5.0971927	5.1945658	5.2920563	5.3896564	.90	
.91	4.4779214	4.5742276	4.6707296	4.7674119	4.8642608	4.9612640	5.0584102	5.1556894	5.2530925	5.3506110	5.4482375	.91	
.92	4.5411868	4.6375451	4.7340953	4.8308224	4.9277129	5.0247549	5.1219375	5.2192506	5.3166855	5.4142338	5.5118883	.92	
.93	4.6107741	4.7071879	4.8037896	4.9005646	4.9974997	5.0945833	5.1918047	5.2891542	5.3866231	5.4842034	5.5818879	.93	
.94	4.6885203	4.7849942	4.8816516	4.9784784	5.0754619	5.1725906	5.2698541	5.3672431	5.4647490	5.5623640	5.6600812	.94	
.95	4.7772250	4.8737650	4.9704838	5.0673678	5.1644046	5.2615830	5.3588931	5.4563257	5.5538725	5.6515260	5.7492793	.95	
.96	4.8814869	4.9781015	5.0748897	5.1718383	5.2689353	5.3661701	5.4635329	5.5610149	5.6586081	5.7563052	5.8540996	.96	
.97	5.0097274	5.1064295	5.2032990	5.3003235	5.3974914	5.4947924	5.5922172	5.6897575	5.7874054	5.8851539	5.9829967	.97	
.98	5.1803029	5.2771145	5.3740861	5.4712058	5.5684627	5.6658471	5.7633501	5.8609637	5.9586806	6.0564941	6.1543982	.98	
.99	5.4493683	5.5463385	5.6434583	5.7407164	5.8381028	5.9356087	6.0332257	6.1309465	6.2287644	6.3266730	6.4246669	.99	

$P \setminus d$	4.0	4.1	4.2	4.3	4.4	4.5	$\bar{R} = R * u,$	$\bar{d} = d * u$	4.7	4.8	4.9	5.0	d/P
.01	1.8573554	1.9506231	2.0443795	2.1385722	2.2331561	2.3280922	2.4233466	2.5188899	2.6146958	2.7107416	2.8070070	2.9032724	.01
.02	2.1189365	2.2130493	2.3075567	2.4024198	2.4976047	2.5930817	2.6888248	2.7848109	2.8810195	2.9774324	3.0740335	3.1708546	.02
.03	2.2857878	2.3803365	2.4752346	2.5704493	2.6659518	2.7617166	2.8577213	2.9539459	3.0503727	3.1469856	3.2437704	3.3415986	.03
.04	2.4116774	2.5065143	2.6016721	2.6971216	2.7928370	2.8887956	2.9849771	3.0813635	3.1779386	3.2746880	3.3715986	3.4684287	.04
.05	2.5142875	2.6093376	2.7046881	2.8003125	2.8961870	2.9922908	3.0886051	3.1851133	3.2818004	3.3786530	3.4756589	3.5728247	.05
.06	2.6017586	2.6969770	2.7924801	2.8882431	2.9842442	3.0804636	3.1768840	3.2734897	3.3702666	3.4672021	3.5642847	3.6615254	.06
.07	2.6785474	2.7739043	2.8695332	2.9654110	3.0615168	3.1578322	3.2543408	3.3510276	3.4478793	3.5448840	3.6420307	3.7393312	.07
.08	2.7473721	2.8428465	2.9385824	3.0345577	3.1307529	3.2271502	3.3237341	3.4204904	3.5174063	3.6144704	3.7116721	3.8090312	.08
.09	2.8100193	2.9055956	3.0014243	3.0974845	3.1937575	3.2902263	3.3868760	3.4836930	3.5806651	3.6777811	3.7750312	3.8723318	.09
.10	2.8677292	2.9633954	3.0593061	3.1554414	3.2517832	3.3483154	3.4450235	3.5418944	3.6389164	3.7360788	3.8333718	3.9297078	.10
.11	2.9214000	3.0171464	3.1131307	3.2093332	3.3057368	3.4023259	3.4990865	3.5960059	3.6930729	3.7902770	3.8876088	3.9846311	.11
.12	2.9717039	3.0675230	3.1635736	3.2598372	3.3562968	3.4529375	3.5497458	3.6467094	3.7438172	3.8410593	3.9384265	4.0353918	.12
.13	3.0191581	3.1150435	3.2111548	3.3074741	3.4039850	3.5006730	3.5975250	3.6945291	3.7916745	3.8889514	3.9863511	4.0838018	.13
.14	3.0641696	3.1601159	3.2562831	3.3526537	3.4492119	3.5459436	3.6428359	3.7398774	3.8370575	3.9343668	4.0317965	4.1292468	.14
.15	3.1070646	3.2030674	3.2992864	3.3957046	3.4923067	3.5890789	3.6860087	3.7830849	3.8802973	3.9776367	4.0750944	4.1726447	.15
.16	3.1481094	3.2441647	3.3404319	3.4368945	3.5335375	3.6303475	3.7273124	3.8244211	3.9216638	4.0190312	4.1165152	4.2140655	.16
.17	3.1875236	3.2836281	3.3799405	3.4764447	3.5731261	3.6699716	3.7669694	3.8641087	3.9613797	4.0587736	4.1562823	4.2538916	.17
.18	3.2254916	3.3216423	3.4179972	3.5145405	3.6112581	3.7081371	3.8051658	3.9023339	3.9996318	4.0970507	4.1945827	4.2921754	.18
.19	3.2621691	3.3583634	3.4547584	3.5513387	3.6480905	3.7450011	3.8420259	3.9392546	4.0365778	4.1340204	4.2315745	4.3292298	.19
.20	3.2976893	3.3939249	3.4903579	3.5869734	3.6837575	3.7806982	3.8777842	3.9750055	4.0723529	4.1698180	4.2673931	4.3651151	.20
.21	3.3321672	3.4284420	3.5249112	3.6215600	3.7183750	3.8153443	3.9124568	4.0097028	4.1070732	4.2045598	4.3021550	4.4000000	.21
.22	3.3657026	3.4620148	3.5585184	3.6551990	3.7520435	3.8490401	3.9461780	4.0434476	4.1408400	4.2383471	4.3359615	4.4337268	.22
.23	3.3983830	3.4947309	3.5912675	3.6879785	3.7848512	3.8818739	3.9790361	4.0763283	4.1737418	4.2712686	4.3689015	4.4666151	.23
.24	3.4302855	3.5266677	3.6232358	3.7199760	3.8168757	3.9139235	4.0110991	4.1084230	4.2058567	4.3034024	4.4010530	4.4988176	.24
.25	3.4614788	3.5578937	3.6544922	3.7512604	3.8481861	3.9452580	4.0424660	4.1398008	4.2372540	4.3348180	4.4324856	4.5302600	.25
.26	3.4920237	3.5884703	3.6850979	3.7818931	3.8788438	3.9759389	4.0731685	4.1705235	4.2679955	4.3655771	4.4632611	4.5610456	.26
.27	3.5219754	3.6184523	3.7151080	3.8119293	3.9089041	4.0060217	4.1032722	4.2006466	4.2981368	4.3957353	4.4934353	4.5911770	.27
.28	3.5513832	3.6478895	3.7445723	3.8414187	3.9384169	4.0355561	4.1328268	4.2302201	4.3277279	4.4253428	4.5230582	4.6208728	.28
.29	3.5802920	3.6768268	3.7735359	3.8704066	3.9674273	4.0645876	4.1618778	4.2592893	4.3568141	4.4544451	4.5521754	4.6500548	.29
.30	3.6087429	3.7053051	3.8020397	3.8989339	3.9959766	4.0931572	4.1904664	4.2878956	4.3854370	4.4830834	4.5808283	4.6786898	.30
.31	3.6367732	3.7333621	3.8301213	3.9270385	4.0241024	4.1213027	4.2186304	4.3160768	4.4136343	4.5112958	4.6090548	4.7069251	.31
.32	3.6644174	3.7610322	3.8578154	3.9547548	4.0518393	4.1490590	4.2464045	4.3438677	4.4414409	4.5391170	4.6368898	4.7348428	.32
.33	3.6917073	3.7883473	3.8851538	3.9821149	4.0792195	4.1764579	4.2738209	4.3713004	4.4688888	4.5665793	4.6643654	4.7619251	.33
.34	3.7186725	3.8153369	3.9121662	4.0091483	4.1062726	4.2035292	4.3009093	4.3984047	4.4960080	4.5937124	4.6915117	4.7892739	.34
.35	3.7453403	3.8420287	3.9388800	4.0358827	4.1330261	4.2303006	4.3276973	4.4252082	4.5228261	4.6205441	4.7183562	4.8162739	.35
.36	3.7717365	3.8684482	3.9653212	4.0623440	4.1595061	4.2567979	4.3542109	4.4517370	4.5493691	4.6471005	4.7449251	4.8427329	.36
.37	3.7978853	3.8946197	3.9915139	4.0885563	4.1857366	4.2830455	4.3804744	4.4780154	4.5756614	4.6734058	4.7712427	4.8691118	.37
.38	3.8238093	3.9205661	4.0174808	4.1145424	4.2117407	4.3090662	4.4065107	4.5040662	4.6017259	4.6994831	4.7973320	4.8952454	.38
.39	3.8495302	3.9463087	4.0432437	4.1403241	4.2375399	4.3348818	4.4323415	4.5299113	4.6275844	4.7253542	4.8232148	4.9210770	.39
.40	3.8750683	3.9718682	4.0688231	4.1659219	4.2631548	4.3605127	4.4579874	4.5555713	4.6532575	4.7510396	4.8489118	4.9467848	.40
.41	3.9004433	3.9972642	4.0942384	4.1913554	4.2886051	4.3859788	4.4834682	4.5810658	4.6787649	4.7765591	4.8744428	4.9723074	.41
.42	3.9256739	4.0225153	4.1195087	4.2166434	4.3139097	4.4112988	4.5080266	4.6064138	4.7041256	4.8019317	4.8998265	4.9977070	.42
.43	3.9507781	4.0476396	4.1446518	4.2418039	4.3390865	4.4364908	4.5340089	4.6316334	4.7293576	4.8271755	4.9250813	5.0229554	.43
.44	3.9757733	4.0726547	4.1696853	4.2668546	4.3641532	4.4615725	4.5591045	4.6567420	4.7544787	4.8523081	4.9502248	5.0481000	.44
.45	4.0006765	4.0975774	4.1946261	4.2918123	4.3891267	4.4865607	4.5841065	4.6817570	4.7795057	4.8773465	4.9752739	5.0732070	.45
.46	4.0255040	4.1224242	4.2194907	4.3166936	4.4140235	4.5114721	4.6090315	4.7066947	4.8044553	4.9023074	5.0002454	5.0981850	.46
.47	4.0502722	4.1472112	4.2442954	4.3415147	4.4388600	4.5363228	4.6338956	4.7315714	4.8293439	4.9272070	5.0251554	5.1230000	.47
.48	4.0749967	4.1719545	4.2690560	4.3662915	4.4636519	4.5611289	4.6587149	4.7564031	4.8541872	4.9520613	5.0500200	5.1480000	.48
.49	4.0996934	4.1966695	4.2937883	4.3910398	4.4884150	4.5859060	4.6835051	4.7812056	4.8790012	4.9768861	5.0748550	5.1728000	.49
.50	4.1243777	4.2213720	4.3185077	4.4157750	4.5131650	4.6106698	4.7082818	4.8059944	4.9038014	5.0016970	5.0996760	5.1976000	.50

$P \backslash d$	4.0	4.1	4.2	4.3	4.4	4.5	$\bar{R} = R * u,$	4.6	4.7	4.8	4.9	5.0	d/P
.50	4.1243777	4.2213720	4.3185077	4.4157750	4.5131650	4.6106698	4.7082818	4.8059944	4.9038014	5.0016970	5.0996760	.50	
.51	4.1490651	4.2460774	4.3432298	4.4405127	4.5379173	4.6354357	4.7330606	4.8307852	4.9286035	5.0265097	5.1244987	.51	
.52	4.1737711	4.2708012	4.3679701	4.4652685	4.5626876	4.6602195	4.7578570	4.8555935	4.9534229	5.0513397	5.1493385	.52	
.53	4.1985112	4.2955589	4.3927443	4.4900579	4.5874913	4.6850366	4.7826867	4.8804350	4.9782754	5.0762026	5.1742113	.53	
.54	4.2233013	4.3203664	4.4175680	4.5148968	4.6123443	4.7099029	4.8075054	4.9053254	5.0031768	5.1011143	5.1991327	.54	
.55	4.2481571	4.3452395	4.4424572	4.5398010	4.6372626	4.7348343	4.8325092	4.9302807	5.0281431	5.1260908	5.2241189	.55	
.56	4.2730950	4.3701945	4.4674281	4.5647869	4.6622624	4.7598472	4.8575343	4.9553173	5.0531905	5.1511484	5.2491861	.56	
.57	4.2981315	4.3952479	4.4924974	4.5898709	4.6873603	4.7849581	4.8826573	4.9804518	5.0783357	5.1763038	5.2743511	.57	
.58	4.3232836	4.4204169	4.5176821	4.6150703	4.7125735	4.8101841	4.9078955	5.0057013	5.1035959	5.2015741	5.2996308	.58	
.59	4.3485689	4.4457190	4.5429998	4.6404026	4.7379194	4.8355429	4.9332663	5.0310834	5.1289887	5.2269769	5.3250431	.59	
.60	4.3740056	4.4711723	4.5684687	4.6658861	4.7634165	4.8610527	4.9587881	5.0566165	5.1545323	5.2525305	5.3506061	.60	
.61	4.3996126	4.4967959	4.5941078	4.6915396	4.7890836	4.8867325	4.9844798	5.0823194	5.1802458	5.2782539	5.3763389	.61	
.62	4.4254097	4.5226095	4.6199368	4.7173830	4.8149405	4.9126020	5.0103612	5.1082120	5.2061490	5.3041670	5.4022614	.62	
.63	4.4514176	4.5486338	4.6459764	4.7434370	4.8410080	4.9386822	5.0364532	5.1343152	5.2322626	5.3302905	5.4283943	.63	
.64	4.4776580	4.5748907	4.6722486	4.7697236	4.8673079	4.9649947	5.0627776	5.1606507	5.2586087	5.3566465	5.4547595	.64	
.65	4.5041542	4.6014032	4.6987764	4.7962657	4.8938634	4.9915628	5.0893575	5.1872418	5.2852102	5.3832579	5.4813803	.65	
.66	4.5309305	4.6281958	4.7255843	4.8230878	4.9206990	5.0184110	5.1162175	5.2141129	5.3120918	5.4101494	5.5082811	.66	
.67	4.5580130	4.6552946	4.7526984	4.8502162	4.9478408	5.0455653	5.1438337	5.2411290	5.3392796	5.4373471	5.5354882	.67	
.68	4.5854296	4.6827276	4.7801466	4.8776787	4.9753167	5.0730539	5.1708841	5.2688017	5.3668017	5.4648791	5.5630296	.68	
.69	4.6132103	4.7105247	4.8079590	4.9055054	5.0031569	5.1009066	5.1987487	5.2966776	5.3946880	5.4927754	5.5909353	.69	
.70	4.6413876	4.7387183	4.8361679	4.9337287	5.0313936	5.1291561	5.2270101	5.3249501	5.4229712	5.5210685	5.6192379	.70	
.71	4.6699963	4.7673434	4.8648084	4.9623837	5.0600621	5.1578372	5.2557032	5.3536545	5.4516862	5.5497936	5.6479724	.71	
.72	4.6990747	4.7964383	4.8939188	4.9915085	5.0892005	5.1869884	5.2848664	5.3828291	5.4808714	5.5789889	5.6771773	.72	
.73	4.7286645	4.8260447	4.9235407	5.0211449	5.1188506	5.2166513	5.3145414	5.4125155	5.5105686	5.6086962	5.7068942	.73	
.74	4.7588114	4.8562083	4.9537199	5.0513388	5.1490582	5.2468719	5.3447741	5.4427597	5.5408236	5.6389615	5.7371692	.74	
.75	4.7895660	4.8869796	4.9845069	5.0821406	5.1798739	5.2777006	5.3756151	5.4736123	5.5716871	5.6698353	5.7680528	.75	
.76	4.8209842	4.9184147	5.0159579	5.1136064	5.2113537	5.3091936	5.4071205	5.5051294	5.6032153	5.7013739	5.7996012	.76	
.77	4.8531284	4.9505760	5.0481352	5.1457988	5.2435602	5.3414134	5.4393529	5.5373735	5.6354706	5.7336398	5.8318771	.77	
.78	4.8860686	4.9835335	5.0811089	5.1787877	5.2765634	5.3744301	5.4723822	5.5704148	5.6685232	5.7667031	5.8649505	.78	
.79	4.9198836	5.0173660	5.1149578	5.2126520	5.3104422	5.4083225	5.5062875	5.6043323	5.7024521	5.8006428	5.8989005	.79	
.80	4.9546629	5.0521631	5.1497715	5.2474813	5.3452862	5.4431804	5.5411585	5.6392155	5.7373470	5.8355487	5.9338168	.80	
.81	4.9905086	5.0880268	5.1856522	5.2833779	5.3811978	5.4791060	5.5770974	5.6751670	5.7733103	5.8715233	5.9698020	.81	
.82	5.0275384	5.1250749	5.2227175	5.3204594	5.4182945	5.5162171	5.6142220	5.7123044	5.8104598	5.9086842	6.0069738	.82	
.83	5.0658886	5.1634439	5.2611040	5.3588625	5.4567131	5.5546504	5.6526691	5.7507046	5.8489323	5.9471684	6.0454691	.83	
.84	5.1057189	5.2032933	5.3009715	5.3987468	5.4966134	5.5945656	5.6925985	5.7907074	5.8888878	5.9871359	6.0854479	.84	
.85	5.1472180	5.2448121	5.3425087	5.4403014	5.5381843	5.6361519	5.7341994	5.8323319	5.9305154	6.0287758	6.1270994	.85	
.86	5.1906115	5.2882258	5.3859413	5.4837519	5.5816516	5.6796351	5.7776975	5.8758343	5.9740411	6.0723142	6.1706499	.86	
.87	5.2361724	5.3338075	5.4315426	5.5293716	5.6272887	5.7252886	5.8233665	5.9215179	6.0197386	6.1180248	6.2163729	.87	
.88	5.2842358	5.3818925	5.4796479	5.5774960	5.6754311	5.7734480	5.8715420	5.9697086	6.0679436	6.1662435	6.2646045	.88	
.89	5.3352198	5.4328990	5.5306756	5.6285436	5.7264975	5.8245321	5.9226428	6.0208252	6.1190753	6.2173893	6.3157639	.89	
.90	5.3896564	5.4873591	5.5851578	5.6830467	5.7810202	5.8790734	5.9772017	6.0754007	6.1736665	6.2719955	6.3703842	.90	
.91	5.44482375	5.5437870	5.6437870	5.7416978	5.8396922	5.9377650	6.0359118	6.1341283	6.2324108	6.3307555	6.4291592	.91	
.92	5.5118883	5.6096421	5.7074889	5.8054232	5.9034395	6.0015332	6.0996997	6.1979350	6.2962351	6.3945966	6.4930163	.92	
.93	5.5818879	5.6796700	5.7775435	5.8755028	5.9735429	6.0716590	6.1698467	6.2681021	6.3664213	6.4648009	6.5632377	.93	
.94	5.6600812	5.7578940	5.8557964	5.9537831	6.0518491	6.1499896	6.2482004	6.3464777	6.4448177	6.5432170	6.6416725	.94	
.95	5.7492793	5.8471261	5.9450607	6.0430777	6.1411723	6.2393399	6.3375764	6.4358780	6.5342410	6.6326623	6.7311387	.95	
.96	5.8540996	5.9519851	6.0499561	6.1480076	6.2461347	6.3443332	6.4425989	6.5409282	6.6393176	6.7377639	6.8362641	.96	
.97	5.9829967	6.0809279	6.1789421	6.2770344	6.3752001	6.4734351	6.5717355	6.6700977	6.7685183	6.8669942	6.9655227	.97	
.98	6.1543982	6.2523872	6.3504560	6.4485999	6.5468145	6.6450958	6.7434402	6.8418441	6.9403044	7.0388181	7.1373825	.98	
.99	6.4246669	6.5227407	6.6208898	6.7191096	6.8173963	6.9157459	7.0141552	7.1126208	7.2111398	7.3097094	7.4083270	.99	

$P \backslash d$	5.0	5.2	5.4	5.6	5.8	6.0	$\bar{R} = R * u,$	6.2	6.4	$\bar{d} = d * u$	6.6	6.8	7.0	d/P
.01	2.8070070	3.0001260	3.1939304	3.3883215	3.5832189	3.7785563	3.9742786	4.1703395	4.3667002	4.5633274	4.7601925	.01		
.02	3.0740335	3.2677434	3.4620492	3.6568694	3.8521369	4.0477958	4.2437991	4.4401073	4.6366864	4.8335076	5.0305459	.02		
.03	3.2437704	3.4378057	3.6323899	3.8274502	4.0229261	4.2187671	4.4149305	4.6113801	4.8080848	5.0050180	5.2021567	.03		
.04	3.3715986	3.5658575	3.7606340	3.9558608	4.1514819	4.3474502	4.5437258	4.7402749	4.9370682	5.1340806	5.3312905	.04		
.05	3.4756589	3.6700879	3.8650111	4.0603653	4.2560978	4.4521641	4.6485264	4.8451523	5.0420143	5.2390882	5.4363534	.05		
.06	3.5642847	3.7588506	3.9538924	4.1493499	4.3451730	4.5413190	4.7377519	4.9344407	5.1313588	5.3284831	5.5257936	.06		
.07	3.6420307	3.8367115	4.0318527	4.2273972	4.4232965	4.6195098	4.8160024	5.0127444	5.2097101	5.4068773	5.6042264	.07		
.08	3.7116721	3.9064517	4.1016788	4.2972982	4.4932635	4.6895352	4.8860796	5.0828678	5.2798750	5.4770793	5.6744621	.08		
.09	3.7750312	3.9698974	4.1652000	4.3608855	4.5569090	4.7532322	4.9498224	5.1466516	5.3436954	5.5409328	5.7383454	.09		
.10	3.8333718	4.0283154	4.2236854	4.4194301	4.6155057	4.8118750	5.0085064	5.2053723	5.4024491	5.5997163	5.7971557	.10		
.11	3.8876088	4.0826222	4.2780532	4.4738514	4.6699742	4.8663855	5.0630541	5.2599535	5.4570603	5.6543545	5.8518185	.11		
.12	3.9384265	4.1335036	4.3289902	4.5248373	4.7210034	4.9174531	5.1141560	5.3110860	5.5082204	5.7055395	5.9030260	.12		
.13	3.9863511	4.1814868	4.3770247	4.5729169	4.7691229	4.9656080	5.1623426	5.3593009	5.5564609	5.7538030	5.9513103	.13		
.14	4.0317965	4.2269865	4.4225720	4.6185060	4.8147491	5.0112672	5.2080312	5.4050159	5.6021997	5.7995633	5.9970901	.14		
.15	4.0750944	4.2703350	4.4659649	4.6619381	4.8582157	5.0547646	5.2515562	5.4485657	5.6457717	5.8431555	6.0407006	.15		
.16	4.1165152	4.3118033	4.5074747	4.7034846	4.8997948	5.0963727	5.2931902	5.4902230	5.6874500	5.8848528	6.0824151	.16		
.17	4.1562823	4.3516150	4.5473256	4.7433702	4.9397111	5.1363164	5.3331584	5.5302132	5.7274600	5.9248807	6.1224594	.17		
.18	4.1945827	4.3899576	4.5857053	4.7817826	4.9781527	5.1747839	5.3716491	5.5687248	5.7659905	5.9634283	6.1610224	.18		
.19	4.2315745	4.4269895	4.6227725	4.8188809	5.0152786	5.2119345	5.4088219	5.6059175	5.8032012	6.0006552	6.1982641	.19		
.20	4.2673931	4.4628462	4.6586627	4.8548009	5.0512250	5.2479044	5.4448129	5.6419276	5.8392284	6.0366980	6.2343210	.20		
.21	4.3021550	4.4976445	4.6934931	4.8896596	5.0861089	5.2828110	5.4797397	5.6768725	5.8741898	6.0716743	6.2693109	.21		
.22	4.3359615	4.5314859	4.7273652	4.9235589	5.1200324	5.3167561	5.5137042	5.71108546	5.9081877	6.1056865	6.3033361	.22		
.23	4.3689015	4.5644592	4.7603680	4.9565879	5.1530847	5.3498292	5.5467960	5.7439632	5.9413115	6.1388241	6.3364863	.23		
.24	4.4010530	4.5966429	4.7925801	4.9888251	5.1853443	5.3821089	5.5790937	5.7762771	5.9736401	6.1711661	6.3688405	.24		
.25	4.4324856	4.6281065	4.8240710	5.0203403	5.2168812	5.4136651	5.6106673	5.8078664	6.0052437	6.2027826	6.4004686	.25		
.26	4.4632611	4.6589120	4.8549029	5.0511957	5.2477575	5.4445602	5.6415793	5.8387936	6.0361845	6.2337359	6.4314334	.26		
.27	4.4934353	4.6891151	4.8851316	5.0814471	5.2780292	5.4748500	5.6718854	5.8691145	6.0665188	6.2640823	6.4617909	.27		
.28	4.5230582	4.7187660	4.9148074	5.1114449	5.3077467	5.5045851	5.7016364	5.8988798	6.0962971	6.2938724	6.4915917	.28		
.29	4.5521754	4.7479104	4.9439758	5.1403348	5.3369557	5.5388113	5.7308780	5.9281353	6.1255652	6.3231520	6.5208817	.29		
.30	4.5808283	4.7765897	4.9726786	5.1690583	5.3656978	5.5625701	5.7596518	5.9569227	6.1543650	6.3519629	6.5497029	.30		
.31	4.6090548	4.8048420	5.0009536	5.1973536	5.3940112	5.5908998	5.7879962	5.9852803	6.1827345	6.3803434	6.5780933	.31		
.32	4.6368898	4.8327020	5.0288358	5.2252557	5.4219310	5.6188354	5.8159461	6.0132431	6.2107091	6.4083287	6.6060883	.32		
.33	4.6643654	4.8602021	5.0563576	5.2527968	5.4494893	5.6464093	5.8435339	6.0408436	6.2383211	6.4359511	6.6337202	.33		
.34	4.6915117	4.8873722	5.0835489	5.2800069	5.4767164	5.6736515	5.8707898	6.0681119	6.2656006	6.4632408	6.6610193	.34		
.35	4.7183562	4.9142401	5.1104375	5.3069140	5.5036400	5.7005899	5.8977417	6.0950759	6.2925756	6.4902258	6.6880135	.35		
.36	4.7449251	4.9408318	5.1370495	5.3335441	5.5302863	5.7272508	5.9244157	6.1217618	6.3192723	6.5169324	6.7147290	.36		
.37	4.7712427	4.9671718	5.1634094	5.3599217	5.5566798	5.7536586	5.9508364	6.1481941	6.3457152	6.5433850	6.7411904	.37		
.38	4.7973320	4.9932831	5.1895402	5.3860699	5.5828435	5.7798364	5.9770268	6.1743961	6.3719276	6.5696069	6.7674210	.38		
.39	4.8232148	5.0191875	5.2154637	5.4120105	5.6087995	5.8058061	6.0030090	6.2003895	6.3979313	6.5956199	6.7934426	.39		
.40	4.8489118	5.0449056	5.2412007	5.4377643	5.6345683	5.8315885	6.0288037	6.2261953	6.4237472	6.6214450	6.8192761	.40		
.41	4.8744428	5.0704574	5.2667709	5.4633511	5.6601700	5.8572035	6.0544308	6.2518333	6.4493951	6.6471020	6.8449414	.41		
.42	4.8998265	5.0958616	5.2921934	5.4887898	5.6856233	5.8826700	6.0799092	6.273225	6.4748942	6.6726100	6.8704576	.42		
.43	4.9250813	5.1211366	5.3174863	5.5140988	5.7109467	5.9080064	6.1052573	6.3026813	6.5002626	6.6979873	6.8958429	.43		
.44	4.9502248	5.1462999	5.3426673	5.5392956	5.7361577	5.9332307	6.1304927	6.3279272	6.5255181	6.7232515	6.9211152	.44		
.45	4.9752739	5.1713686	5.3677535	5.5643974	5.7612736	5.9583587	6.1556326	6.3530775	6.5506779	6.7484199	6.9462914	.45		
.46	5.0002454	5.1963594	5.3927615	5.5894209	5.7863109	5.9834086	6.1806938	6.3781489	6.5757586	6.7735092	6.9713886	.46		
.47	5.0251554	5.2212885	5.4177077	5.6143823	5.8112860	6.0083960	6.2056924	6.4031578	6.6007767	6.7985357	6.9964228	.47		
.48	5.0500200	5.2461720	5.4426080	5.6392977	5.8362150	6.033373	6.2306447	6.4281201	6.6257483	6.8235156	7.0214104	.48		
.49	5.0748550	5.2710257	5.4674783	5.6641830	5.8611137	6.0582481	6.2555665	6.4530519	6.6506891	6.8484648	7.0463672	.49		
.50	5.0996760	5.2958652	5.4923344	5.6890538	5.8859978	6.0831442	6.2804735	6.4779688	6.6756150	6.8733989	7.0713088	.50		

$P \backslash d$	5.0	5.2	5.4	5.6	5.8	6.0	$\bar{R} = R * u,$	$\bar{d} = d * u$	6.6	6.8	7.0	d/P
.50	5.0996760	5.2958652	5.4923344	5.6890538	5.8859978	6.0831442	6.2804735	6.4779088	6.6756150	6.8733989	7.0713088	.50
.51	5.1244987	5.3207062	5.5171917	5.7139257	5.9108829	6.1080412	6.3053814	6.5028864	6.7005416	6.8983337	7.0962511	.51
.52	5.1493385	5.3455642	5.5420659	5.7388145	5.9357848	6.1329549	6.3303057	6.5278205	6.7254846	6.9232848	7.1212096	.52
.53	5.1742113	5.3704549	5.5669727	5.7637357	5.9607190	6.1579009	6.3552624	6.5527868	6.7504597	6.9482680	7.1462002	.53
.54	5.1991327	5.3953942	5.5919280	5.7887053	5.9857015	6.1828950	6.3802671	6.5778012	6.7754828	6.9732991	7.1712388	.54
.55	5.2241189	5.4203981	5.6169477	5.8137393	6.0107484	6.2079535	6.4053360	6.6028797	6.8005701	6.9983944	7.1963413	.55
.56	5.2491861	5.4454830	5.6420483	5.8388541	6.0358759	6.2330925	6.4304856	6.6280387	6.8257378	7.0235701	7.2215243	.56
.57	5.2743511	5.4706654	5.6672465	5.8640663	6.0611008	6.2583289	6.4575324	6.6532951	6.8510028	7.0488430	7.2468045	.57
.58	5.2996308	5.4959626	5.6925593	5.8893931	6.0864403	6.2836799	6.4810937	6.6786658	6.8763822	7.0742303	7.2721990	.58
.59	5.3250431	5.5213923	5.7180045	5.9148523	6.1119120	6.3091630	6.5065872	6.7041088	6.9018937	7.0997497	7.2977257	.59
.60	5.3506061	5.5469726	5.7436003	5.9404621	6.1375344	6.3347967	6.5322313	6.7298223	6.9275558	7.1254197	7.3234029	.60
.61	5.3763389	5.5727227	5.7693658	5.9662415	6.1633263	6.3606001	6.5580449	6.7556453	6.9533875	7.1512592	7.3492497	.61
.62	5.4022614	5.5986624	5.7953209	5.9922105	6.1893078	6.3865929	6.5840481	6.7816579	6.9794086	7.1772882	7.3752859	.62
.63	5.4283943	5.6248124	5.8214864	6.0183898	6.2154927	6.4127962	6.6102617	6.8078809	7.0056402	7.2035277	7.4015326	.63
.64	5.4547595	5.6511949	5.8478843	6.0448015	6.2419240	6.4392318	6.6367076	6.8343362	7.0321041	7.2299995	7.4280116	.64
.65	5.4813803	5.6778328	5.8745376	6.0714688	6.2686037	6.4659229	6.6634090	6.8610470	7.0588236	7.2567269	7.4547463	.65
.66	5.5082811	5.7047508	5.9014711	6.0984161	6.2955636	6.4928942	6.6903907	6.8880381	7.0858233	7.2837345	7.4817612	.66
.67	5.5354882	5.7319751	5.9287108	6.1256698	6.3228299	6.5201719	6.7176788	6.9153357	7.1131296	7.3110487	7.5090827	.67
.68	5.5630296	5.7595338	5.9562850	6.1532579	6.3504306	6.5477840	6.7453014	6.9429678	7.1407760	7.3386975	7.5367389	.68
.69	5.5909353	5.7874568	5.9842236	6.1812105	6.3783959	6.5757608	6.7732886	6.9709647	7.1687760	7.3667112	7.5647599	.69
.70	5.6192379	5.8157768	6.0125591	6.2095602	6.4067583	6.6041348	6.8016732	6.9993588	7.1971789	7.3951222	7.5931784	.70
.71	5.6479724	5.8445288	6.0413269	6.2383421	6.4355531	6.6329412	6.8304901	7.0281855	7.2260145	7.4239659	7.6220296	.71
.72	5.6771773	5.8737512	6.0705651	6.2673946	6.4648185	6.6622183	6.8597780	7.0574831	7.2553210	7.4532806	7.6513519	.72
.73	5.7068894	5.9034859	6.1003157	6.2973595	6.4945964	6.6920081	6.8895785	7.0851404	7.2851404	7.4831083	7.6811872	.73
.74	5.7371692	5.9337787	6.1306245	6.3276829	6.5249329	6.7223566	6.9199378	7.1176627	7.3155188	7.5134951	7.7115817	.74
.75	5.7680528	5.9646803	6.1615424	6.3586154	6.5558787	6.7533144	6.9509067	7.1486416	7.3465069	7.5444917	7.7425860	.75
.76	5.7996012	5.9962469	6.1931254	6.3902132	6.5874900	6.7849379	6.9825413	7.1802864	7.3781611	7.5761544	7.7742567	.76
.77	5.8318771	6.0285412	6.2254363	6.4225391	6.6198295	6.8172897	7.0149044	7.2126599	7.4105460	7.6085460	7.8066563	.77
.78	5.8649505	6.0616333	6.2585452	6.4556632	6.6529674	6.8504402	7.0480663	7.2458323	7.4437260	7.6417368	7.8398553	.78
.79	5.8989005	6.0956023	6.2925312	6.4896647	6.6869829	6.8844685	7.0821063	7.2798829	7.4777863	7.6758062	7.8739329	.79
.80	5.9338168	6.1305379	6.3274842	6.5246334	6.7219659	6.9194644	7.1171141	7.3149015	7.5128150	7.7108440	7.9089791	.80
.81	5.9698020	6.1665426	6.3635067	6.5606719	6.7580189	6.9555307	7.1531924	7.3509909	7.5489146	7.7469529	7.9450967	.81
.82	6.0069738	6.2037345	6.4007166	6.5978981	6.7952600	6.9927853	7.1904595	7.3882693	7.5862033	7.7842512	7.9824038	.82
.83	6.0454691	6.2422502	6.4392508	6.6364491	6.8338262	7.0313654	7.2290522	7.4268736	7.6248183	7.8228760	8.0210377	.83
.84	6.0854479	6.2822500	6.4792696	6.6764851	6.8738777	7.0714312	7.2691309	7.4669643	7.6649199	7.8629877	8.0611587	.84
.85	6.1270994	6.3239232	6.5209622	6.7181954	6.9156041	7.1131722	7.3108854	7.5087310	7.7066979	7.9047761	8.1029567	.85
.86	6.1706499	6.3674959	6.5645550	6.7618064	6.9592318	7.1568150	7.3545420	7.5524003	7.7503789	7.9484679	8.1466584	.86
.87	6.2163729	6.4132420	6.6103220	6.8075922	7.0050347	7.2026337	7.4003750	7.5982465	7.7962372	7.9943373	8.1925381	.87
.88	6.2646045	6.4614975	6.6585991	6.8558891	7.0533495	7.2509647	7.4487210	7.6466062	7.8446095	8.0427213	8.2409328	.88
.89	6.3157639	6.5126819	6.7098061	6.9071166	7.1045957	7.3022280	7.4999999	7.6978995	7.8959160	8.0940399	8.2922628	.89
.90	6.3703842	6.5673284	6.7644765	6.9618085	7.1593073	7.3569575	7.5547459	7.7526606	7.9506910	8.1488278	8.3470625	.90
.91	6.4291592	6.6261312	6.8233043	7.0206592	7.2181788	7.4158481	7.6136539	7.8115846	8.0096298	8.2077801	8.4060274	.91
.92	6.4930163	6.6900178	6.8872178	7.0845971	7.2821389	7.4798285	7.6776530	7.8756008	8.0736617	8.2718266	8.4700874	.92
.93	6.5632377	6.7602711	6.9575000	7.1549055	7.3542713	7.5501829	7.7480275	7.9459938	8.1440718	8.3422525	8.5405278	.93
.94	6.6416725	6.8387408	7.0360012	7.2334355	7.4310276	7.6287632	7.8266298	8.0246164	8.2227131	8.4209110	8.6192024	.94
.95	6.7311387	6.9282456	7.1255412	7.3230076	7.5206288	7.7183912	7.9162825	8.1142917	8.3124093	8.5106266	8.7089358	.95
.96	6.8362641	7.0334152	7.2307510	7.4282540	7.6259087	7.8237018	8.0216212	8.2196564	8.4177980	8.6160374	8.8143672	.96
.97	6.9655227	7.1627263	7.3601099	7.5576565	7.7553511	7.9531808	8.1511338	8.3492000	8.5473702	8.7456362	8.9439905	.97
.98	7.1373825	7.3346531	7.5320976	7.7296998	7.9274454	8.1253219	8.3233181	8.5214240	8.7196309	8.9179309	9.1163168	.98
.99	7.4083270	7.6056968	7.8032318	8.0009168	8.1987383	8.3966846	8.5947451	8.7929105	8.9911724	9.1895234	9.3879567	.99

$P \setminus d$	7.0	7.2	7.4	7.6	7.8	8.0	$\bar{R} = R * u$,	$\bar{d} = d * u$	8.6	8.8	9.0	d/P
.01	4.7601925	4.9572712	5.1545421	5.3519868	5.5495890	5.7473346	5.9452111	6.1432072	6.3413131	6.5395199	6.7378198	.01
.02	5.0305459	5.2277798	5.4251903	5.6227611	5.8204775	6.0183269	6.2162980	6.4143805	6.6125657	6.8108454	7.0092123	.02
.03	5.2021567	5.3994808	5.5969727	5.7946172	5.9924007	6.1903111	6.3883380	6.5864716	6.7847037	6.9830266	7.1814335	.03
.04	5.3312905	5.5286786	5.7262286	5.9239257	6.1217570	6.3197112	6.5177780	6.7159484	6.9142142	7.1125682	7.3110038	.04
.05	5.4363534	5.6337915	5.8313867	6.0291248	6.2269936	6.4249820	6.6230802	6.8212794	7.0195717	7.2179502	7.4164084	.05
.06	5.5257936	5.7232728	5.9209052	6.1186772	6.3165769	6.5145935	6.7127176	6.9109406	7.1092548	7.3076536	7.5061305	.06
.07	5.6042264	5.8017404	5.9994045	6.1972054	6.3951314	6.5931721	6.7913183	6.9895617	7.1878948	7.3863109	7.5848039	.07
.08	5.6744621	5.8720066	6.0696983	6.2675244	6.4654735	6.6635353	6.8617009	7.0599621	7.2583117	7.4567430	7.6552501	.08
.09	5.7383454	5.9359170	6.1336333	6.3314818	6.5294514	6.7275321	6.9257149	7.1239921	7.3223563	7.5208012	7.7193210	.09
.10	5.7971557	5.9947517	6.1924902	6.3903590	6.5883471	6.7864447	6.9846432	7.1829348	7.3813123	7.5797695	7.7783007	.10
.11	5.8518185	6.0494367	6.2471954	6.4450827	6.6430877	6.8412009	7.0394137	7.2377184	7.4361081	7.6345765	7.8331181	.11
.12	5.9030260	6.1006646	6.2984420	6.4963463	6.6943669	6.8924944	7.0907203	7.2890372	7.4874381	7.6859170	7.8844683	.12
.13	5.9513103	6.1489679	6.3467626	6.5446827	6.7427178	6.9408586	7.1390968	7.3374249	7.5358363	7.7343249	7.9328851	.13
.14	5.9970901	6.1947654	6.3925762	6.5905111	6.7885597	6.9867129	7.1849626	7.3833013	7.5817225	7.7802201	7.9787888	.14
.15	6.0407006	6.2383925	6.4362185	6.6341672	6.8322285	7.0303935	7.2286539	7.4270026	7.6254330	7.8239391	8.0225157	.15
.16	6.0824151	6.2801227	6.4779630	6.6759248	6.8739981	7.0721741	7.2704447	7.4688028	7.6672419	7.8657561	8.0643402	.16
.17	6.1224594	6.3201818	6.5180357	6.7160099	6.9140946	7.1122811	7.3105614	7.5089284	7.7073757	7.9058976	8.1044889	.17
.18	6.1610224	6.3587590	6.5566257	6.7546118	6.9527074	7.1509038	7.3491933	7.5475688	7.7460240	7.9445533	8.1431513	.18
.19	6.1982641	6.3960141	6.5938932	6.7918905	6.9899965	7.1882024	7.3865007	7.5848844	7.7833471	7.9818833	8.1804879	.19
.20	6.2343210	6.4320839	6.6299748	6.8279829	7.0260988	7.2243139	7.4226206	7.6210120	7.8194820	8.0180249	8.2166357	.20
.21	6.2693109	6.4670862	6.6649884	6.8630068	7.0611322	7.2593561	7.4576709	7.6560699	7.8545468	8.0530962	8.2517129	.21
.22	6.3033361	6.5011233	6.6990364	6.8970648	7.0951994	7.2934317	7.4917543	7.6901605	7.8886441	8.0871997	8.2858222	.22
.23	6.3364863	6.5342850	6.7320855	6.9302466	7.1283900	7.3266305	7.5249606	7.7233738	7.9218639	8.1204255	8.3190536	.23
.24	6.3688405	6.5666502	6.7645839	6.9626313	7.1607832	7.3590316	7.5573690	7.7557889	7.9542853	8.1528527	8.3514862	.24
.25	6.4004686	6.5982891	6.7962326	6.9942890	7.1924492	7.3907052	7.5890497	7.7874762	7.9859786	8.1845516	8.3831904	.25
.26	6.4314334	6.6292642	6.8272173	7.0252824	7.2234507	7.4217141	7.6200655	7.8184983	8.0170066	8.2155851	8.4142290	.26
.27	6.4617909	6.6596318	6.8575941	7.0556677	7.2538438	7.4521145	7.6504725	7.8489114	8.0474255	8.2460093	8.4446582	.27
.28	6.4915917	6.6894424	6.8874137	7.0854956	7.2816793	7.4819570	7.6803215	7.8787665	8.0772861	8.2758751	8.4745288	.28
.29	6.5208817	6.7187421	6.9167221	7.1148120	7.3130032	7.5112877	7.7096586	7.9081094	8.1066345	8.3052286	8.5038870	.29
.30	6.5497029	6.7475725	6.9455611	7.1436589	7.3418573	7.5401485	7.7385255	7.9369821	8.1355125	8.3341115	8.5327745	.30
.31	6.5780933	6.7759721	6.9739690	7.1720745	7.3702800	7.5685777	7.7669608	7.9654230	8.1639585	8.3625624	8.5612300	.31
.32	6.6060883	6.8039760	7.0019811	7.2000941	7.3983065	7.5966106	7.7949996	7.9934672	8.1920079	8.3906165	8.5892885	.32
.33	6.6337202	6.8316167	7.0296298	7.2277501	7.4259693	7.6242797	7.8226745	8.0211475	8.2196932	8.4183064	8.6169827	.33
.34	6.6610193	6.8589243	7.0569452	7.2550728	7.4532986	7.6516151	7.8500156	8.0484939	8.2470445	8.4456623	8.6443428	.34
.35	6.6880135	6.8859268	7.0839554	7.2820901	7.4803224	7.6786450	7.8770510	8.0755345	8.2740899	8.4727122	8.6713969	.35
.36	6.7147290	6.9126506	7.1106867	7.3088283	7.5070671	7.7053956	7.9038071	8.1022957	8.3008558	8.4994825	8.6981714	.36
.37	6.7411904	6.9391201	7.1371637	7.3353121	7.5335572	7.7318915	7.9303084	8.1288020	8.3273668	8.5259979	8.7246907	.37
.38	6.7674210	6.9653586	7.1634095	7.3615647	7.5598159	7.7581560	7.9565782	8.1550767	8.3536461	8.5522814	8.7509783	.38
.39	6.7934426	6.9913880	7.1894462	7.3876079	7.5858653	7.7842110	7.9826385	8.1811419	8.3797158	8.5783553	8.7770561	.39
.40	6.8192761	7.0172293	7.2152945	7.4134628	7.6117262	7.8100774	8.0085101	8.2070183	8.4055966	8.6042403	8.8029450	.40
.41	6.8449414	7.0429022	7.2409744	7.4391491	7.6374185	7.8357752	8.0342130	8.2327259	8.4313087	8.6299565	8.8286649	.41
.42	6.8704576	7.0684259	7.2665049	7.4646861	7.6629613	7.8613235	8.0597663	8.2582838	8.4568709	8.6555228	8.8542351	.42
.43	6.8958429	7.0938186	7.2919045	7.4900919	7.6883729	7.8867405	8.0851883	8.2837105	8.4823019	8.6809577	8.8796737	.43
.44	6.9211152	7.1190982	7.3171908	7.5153848	7.7136712	7.9120440	8.1104967	8.3090235	8.5076192	8.7062790	8.9049987	.44
.45	6.9462914	7.1442817	7.3423810	7.5405808	7.7388732	7.9372513	8.1357089	8.3342402	8.5328401	8.7315038	8.9302272	.45
.46	6.9713886	7.1693860	7.3674919	7.5656977	7.7639958	7.9623791	8.1608415	8.3593773	8.5579814	8.7566490	8.9553760	.46
.47	6.9964228	7.1944274	7.3925398	7.5907517	7.7890553	7.9874438	8.1859110	8.3844512	8.5830594	8.7817309	8.9804616	.47
.48	7.0214104	7.2194220	7.4175409	7.6157588	7.8140679	8.0124615	8.2109334	8.4094781	8.6080904	8.8067658	9.0055000	.48
.49	7.0463672	7.2443857	7.4425111	7.6407348	7.8390495	8.0374482	8.2359248	8.4344738	8.6330902	8.8317694	9.0305071	.49
.50	7.0713088	7.2693343	7.4674661	7.6656957	7.8640158	8.0624195	8.2609008	8.4594542	8.6580746	8.8567576	9.0554989	.50

$P \backslash d$	7.0	7.2	7.4	7.6	7.8	8.0	$\bar{R} = R * u,$	$\bar{d} = d * u$	8.2	8.4	8.6	8.8	9.0	d/P
.50	7.0713088	7.2693343	7.4674661	7.6656957	7.8640158	8.0624195	8.2609008	8.4594542	8.6580746	8.8567576	9.0554989	9.2542415	9.4530343	.50
.51	7.0962511	7.2942835	7.4924215	7.6906570	7.8889825	8.0873913	8.2858772	8.4844349	8.6830594	8.8817461	9.0804909	9.2792338	9.4780000	.51
.52	7.1212096	7.3192489	7.5173932	7.7156345	7.9139654	8.1123791	8.3108697	8.5094317	8.7080602	8.9067506	9.1054990	9.3042489	9.5030000	.52
.53	7.1462002	7.3442462	7.5423969	7.7406440	7.9389802	8.1373989	8.3358941	8.5344603	8.7330928	8.9317870	9.1305388	9.3292877	9.5280000	.53
.54	7.1712388	7.3692915	7.5674484	7.7657012	7.9640428	8.1624664	8.3609662	8.5595367	8.7581732	8.9568711	9.1556263	9.3543750	9.5530000	.54
.55	7.1963413	7.3944008	7.5925639	7.7908225	7.9891693	8.1875978	8.3861022	8.5846770	8.7833174	8.9820190	9.1807777	9.3795444	9.5780000	.55
.56	7.2213243	7.4195905	7.6177598	7.8160241	8.0143762	8.2128096	8.4113185	8.6098976	8.8085419	9.0072472	9.2060094	9.4047722	9.6035444	.56
.57	7.2468045	7.4448774	7.6430528	7.8413228	8.0396802	8.2381185	8.4366320	8.6352153	8.8338636	9.0325725	9.2313381	9.4299999	9.6285444	.57
.58	7.2721990	7.4702786	7.6684602	7.8667359	8.0650985	8.2635418	8.4620597	8.6606472	8.8592995	9.0580121	9.2567812	9.4550000	9.6535444	.58
.59	7.2977257	7.4958120	7.6939997	7.8922811	8.0906490	8.2890971	8.4876196	8.6862113	8.8848675	9.0835838	9.2823563	9.4810000	9.6795444	.59
.60	7.3234029	7.5214958	7.7196897	7.9179767	8.1163499	8.3148028	8.5133298	8.7119258	8.9105859	9.1093059	9.3080819	9.5068777	9.7055444	.60
.61	7.3492497	7.5473492	7.7455492	7.9438419	8.1422203	8.3406782	8.5392098	8.7378099	8.9364740	9.1351977	9.3339770	9.5327777	9.7315444	.61
.62	7.3752859	7.5733921	7.7715983	7.9698967	8.1682803	8.3667431	8.5652792	8.7638836	8.9625516	9.1612789	9.3600617	9.5588777	9.7575444	.62
.63	7.4015326	7.5996455	7.7978577	7.9961618	8.1945507	8.3930184	8.5915590	8.7901677	8.9888396	9.1875707	9.3863569	9.5850000	9.7835444	.63
.64	7.4280116	7.6261312	7.8243496	8.0226594	8.2210536	8.4195261	8.6180713	8.8166842	9.0153601	9.2140949	9.4128846	9.6115444	9.8100000	.64
.65	7.4547463	7.6528725	7.8510971	8.0494126	8.2478121	8.4462896	8.6448394	8.8434565	9.0421364	9.2408749	9.4396681	9.6383333	9.8370000	.65
.66	7.4817612	7.6798942	7.8781250	8.0764462	8.2748510	8.4733334	8.6718878	8.8705092	9.0691931	9.2679353	9.4667320	9.6654444	9.8640000	.66
.67	7.5090827	7.7072224	7.9054595	8.1037864	8.3021966	8.5006839	8.6992429	8.8978687	9.0965566	9.2953025	9.4941028	9.6928777	9.8915444	.67
.68	7.5367389	7.7348854	7.9331287	8.1314614	8.3298769	8.5283693	8.7269329	8.9255630	9.1242549	9.3230047	9.5218084	9.7205444	9.9192444	.68
.69	7.5647599	7.7629132	7.9611628	8.1595014	8.3579223	8.5564197	8.7549880	8.9536224	9.1523184	9.3510719	9.5498793	9.7486777	9.9475444	.69
.70	7.5931784	7.7913385	7.9895944	8.1879389	8.3863653	8.5848677	8.7834407	8.9820795	9.1807796	9.3795370	9.5783479	9.7771444	9.9760000	.70
.71	7.6220296	7.8201966	8.0184589	8.2168093	8.4152411	8.6137486	8.8123264	9.0109697	9.2096739	9.4084351	9.6072497	9.8060777	10.0048444	.71
.72	7.6513519	7.8495259	8.0477946	8.2461059	8.4445883	8.6431010	8.8416836	9.0403313	9.2390397	9.4378048	9.6366231	9.8354444	10.0342444	.72
.73	7.6811872	7.8793682	8.0776435	8.2760059	8.4744849	8.6729667	8.8715541	9.0702063	9.2689190	9.4676881	9.6665100	9.8653333	10.0636444	.73
.74	7.7115817	7.9097698	8.1080517	8.3064201	8.5048688	8.7033919	8.9019842	9.1006410	9.2993579	9.4981310	9.6969567	9.8957777	10.0945444	.74
.75	7.7425860	7.9407814	8.1390699	8.3374445	8.5358989	8.7344273	8.9330246	9.1316860	9.3304073	9.5291844	9.7280139	9.9268444	10.1257444	.75
.76	7.7742567	7.9724593	8.1707546	8.3691354	8.5675956	8.7661295	8.9647318	9.1633979	9.3621235	9.5609048	9.7597382	9.9585444	10.1549444	.76
.77	7.8066563	8.0048663	8.2031684	8.4015557	8.6002217	8.7985611	8.9971685	9.1958394	9.3945695	9.5933550	9.7921922	9.9910444	10.1841444	.77
.78	7.8398553	8.0380729	8.2363819	8.4347756	8.6332477	8.8317926	9.0304052	9.2290810	9.4278156	9.6266053	9.8254465	10.0242444	10.2230444	.78
.79	7.8739329	8.0721581	8.2704743	8.4688745	8.6673527	8.8659033	9.0645212	9.2632019	9.4619412	9.6607352	9.8595806	10.0583333	10.2571444	.79
.80	7.9089791	8.1072122	8.3055355	8.5039425	8.7024269	8.9009833	9.0996066	9.2982924	9.4970364	9.6958348	9.8946843	10.0935444	10.2923444	.80
.81	7.9450967	8.1433377	8.3416685	8.5400823	8.7385730	8.9371354	9.1357642	9.3344551	9.5332040	9.7320070	9.9308607	10.1296444	10.3284444	.81
.82	7.9824038	8.1806530	8.3789913	8.5774121	8.7759094	8.9744778	9.1731123	9.3718085	9.5705623	9.7693700	9.9682280	10.1670444	10.3658444	.82
.83	8.0210377	8.2192952	8.4176413	8.6160693	8.8145733	9.0131479	9.2117882	9.4104899	9.6092487	9.8080611	10.006924	10.2057444	10.4045444	.83
.84	8.0611587	8.2594249	8.4577789	8.6562143	8.8547252	9.0533062	9.2519526	9.4506598	9.6494239	9.8482412	10.047108	10.2459444	10.4447444	.84
.85	8.1029567	8.3012317	8.4995940	8.6980370	8.8965550	9.0951427	9.2937952	9.4925082	9.6912777	9.8901001	10.088972	10.2877444	10.4865444	.85
.86	8.1466584	8.3449426	8.5433134	8.7417643	8.9402897	9.1388842	9.3375431	9.5362621	9.7350372	9.9338649	10.132742	10.3315444	10.5303444	.86
.87	8.1925381	8.3908319	8.5892115	8.7876707	8.9862037	9.1848053	9.3834709	9.5821961	9.7809771	9.9798102	10.178692	10.3774444	10.5762444	.87
.88	8.2409328	8.4392365	8.6376254	8.8360931	9.0346341	9.2332432	9.4319157	9.6306474	9.8294345	10.028273	10.227161	10.4260444	10.6248444	.88
.89	8.2922628	8.4905769	8.6889754	8.8874521	9.0860015	9.2846184	9.4832982	9.6820367	9.8808302	10.079675	10.278568	10.4774444	10.6762444	.89
.90	8.3470625	8.5453876	8.7437963	8.9422825	9.1408407	9.3394658	9.5381533	9.7368891	9.9356993	10.134550	10.333449	10.5323444	10.7311444	.90
.91	8.4060274	8.6043642	8.8027837	9.0012800	9.1998476	9.3984815	9.5971772	9.7959306	9.9947380	10.193596	10.392501	10.5914444	10.7902444	.91
.92	8.4700874	8.6684366	8.8668678	9.0653749	9.2639525	9.4625958	9.6613003	9.8600619	10.058877	10.257742	10.456654	10.6554444	10.8542444	.92
.93	8.5405278	8.7388906	8.9373343	9.1358530	9.3344416	9.5330950	9.7318090	9.9305796	10.129403	10.328276	10.527195	10.7260444	10.9248444	.93
.94	8.6192024	8.8175800	9.0160375	9.2145691	9.4131696	9.6118342	9.8105587	10.009339	10.208172	10.407053	10.605981	10.8048444	11.0036444	.94
.95	8.7089358	8.9073300	9.1058029	9.3043489	9.5029628	9.7016400	9.9003762	10.099167	10.298010	10.496902	10.695838	10.8947444	11.0935444	.95
.96	8.8143672	9.0127804	9.2112711	9.4098336	9.6084630	9.8071546	10.005904	10.204708	10.403563	10.602466	10.801413	11.0002444	11.1990444	.96
.97	8.9439905	9.1424266	9.3409386	9.5395209	9.7381687	9.9368777	10.135644	10.334463	10.533332	10.732248	10.931208	11.1300777	11.3288444	.97
.98	9.1163168	9.3147823	9.5133216	9.7119294	9.9106011	10.109332	10.308119	10.506958	10.705846	10.904779	11.103755	11.3025444	11.5013444	.98
.99	9.3879567	9.5864663	9.7850467	9.9836930	10.182401	10.381165	10.579984	10.778852	10.977768	11.176727	11.375728	11.5745444	11.7733444	.99

$P \backslash d$	9.0	9.2	9.4	9.6	9.8	10.0	$\bar{R} = R * u$,	14.0	16.0	18.0	20.0	d/P
.01	6.7378198	6.9362057	7.1346712	7.3332104	7.5318183	7.7304900	9.7199310	11.712687	13.707407	15.703387	17.700223	.01
.02	7.0092123	7.2076601	7.4061828	7.6047751	7.8034323	8.0021498	9.9919144	11.984852	13.979683	15.975736	17.972623	.02
.03	7.1814335	7.3799181	7.5784750	7.7770990	7.9757856	8.1745306	10.164490	12.157538	14.152438	16.148536	18.145455	.03
.04	7.3110038	7.5095150	7.7080966	7.9067435	8.1054515	8.3042164	10.294318	12.287446	14.282396	16.278528	18.275470	.04
.05	7.4164084	7.6149406	7.8135416	8.0122067	8.2109315	8.4097121	10.399927	12.393119	14.388109	16.384268	18.381228	.05
.06	7.5061305	7.7046801	7.9032973	8.1019774	8.3007162	8.4995099	10.498818	12.483064	14.478088	16.474269	18.471245	.06
.07	7.5848039	7.7833684	7.9819994	8.1806924	8.3794433	8.5782482	10.598637	12.561930	14.556983	16.553183	18.550173	.07
.08	7.6552501	7.8538277	8.0524709	8.2511752	8.4499366	8.6487515	10.639212	12.632546	14.627624	16.623842	18.620844	.08
.09	7.7193210	7.9179103	8.1165643	8.3152788	8.5140497	8.7128734	10.703397	12.696768	14.691870	16.688103	18.685116	.09
.10	7.7783007	7.9769006	8.1755645	8.3742882	8.5730676	8.7718993	10.762481	12.755886	14.751009	16.747256	18.744279	.10
.11	7.8331181	8.0317278	8.2304007	8.4291328	8.6279202	8.8267593	10.817395	12.810830	14.805973	16.802233	18.799265	.11
.12	7.8844683	8.0830868	8.2817682	8.4805081	8.6793027	8.8781486	10.868833	12.862297	14.857458	16.853731	18.850772	.12
.13	7.9328851	8.1315121	8.3302012	8.5289484	8.7277498	8.9266020	10.917333	12.910824	14.906001	16.902286	18.899335	.13
.14	7.9787888	8.1774235	8.3761200	8.5748739	8.7736817	8.9725399	10.963314	12.956830	14.952024	16.948319	18.945375	.14
.15	8.0225157	8.2211579	8.4198612	8.6186215	8.8174353	9.0162992	11.007114	13.000654	14.995863	16.992168	18.989232	.15
.16	8.0643402	8.2629894	8.4616992	8.6604656	8.8592851	9.0581542	11.049008	13.042570	15.037794	17.034109	19.031179	.16
.17	8.1044889	8.3031446	8.5018606	8.7006329	8.8994578	9.0983320	11.089223	13.082807	15.078044	17.074368	19.071445	.17
.18	8.1431513	8.3418134	8.5405353	8.7393130	8.9381431	9.1370221	11.127948	13.121553	15.116803	17.113136	19.110219	.18
.19	8.1804879	8.3791560	8.5778836	8.7766666	8.9755016	9.1743853	11.165345	13.158969	15.154232	17.150574	19.147663	.19
.20	8.2166357	8.4153097	8.6140426	8.8128307	9.0116704	9.2105586	11.201550	13.195194	15.190469	17.186819	19.183914	.20
.21	8.2517129	8.4503925	8.6491306	8.8479236	9.0467679	9.2456603	11.236684	13.230346	15.225632	17.221990	19.219091	.21
.22	8.2858222	8.4845072	8.6832504	8.8820481	9.0808968	9.2797933	11.270847	13.264527	15.259825	17.256190	19.253297	.22
.23	8.3190536	8.5177437	8.7164918	8.9152940	9.1141470	9.3130475	11.304613	13.297827	15.293136	17.289509	19.286621	.23
.24	8.3514862	8.5501814	8.7489342	8.9477408	9.1465979	9.3455023	11.336613	13.330327	15.325647	17.322027	19.319144	.24
.25	8.3831904	8.5818905	8.7806479	8.9794588	9.1783199	9.3772280	11.368366	13.362097	15.357427	17.353814	19.350936	.25
.26	8.4142290	8.6129338	8.8116956	9.0105107	9.2093757	9.4082875	11.399453	13.393199	15.388539	17.384933	19.382060	.26
.27	8.4446582	8.6433676	8.8421338	9.0409529	9.2398217	9.4387370	11.429928	13.423690	15.419040	17.415441	19.412572	.27
.28	8.4745288	8.6732428	8.8720131	9.0708362	9.2697087	9.4686275	11.459844	13.453621	15.448981	17.445388	19.442524	.28
.29	8.5038870	8.7026054	8.9013798	9.1002067	9.2990828	9.4980050	11.489247	13.483038	15.478408	17.474821	19.471962	.29
.30	8.5327745	8.7314972	8.9302757	9.1291064	9.3279860	9.5269115	11.518177	13.511983	15.507362	17.503782	19.500928	.30
.31	8.5612300	8.7599569	8.9587393	9.1575736	9.3564567	9.5553855	11.546675	13.540495	15.535883	17.532310	19.529459	.31
.32	8.5892885	8.7880195	8.9868058	9.1856438	9.3845302	9.5834622	11.574775	13.568609	15.564006	17.560439	19.557593	.32
.33	8.6169827	8.8157178	9.0145078	9.2133494	9.4122391	9.6111742	11.602510	13.596358	15.591764	17.588202	19.585360	.33
.34	8.6443428	8.8430819	9.0418756	9.2407206	9.4396137	9.6385518	11.629911	13.623772	15.619186	17.615630	19.612793	.34
.35	8.6713969	8.8701399	9.0689373	9.2677857	9.4666820	9.6656231	11.657004	13.650878	15.646301	17.642751	19.639918	.35
.36	8.6981714	8.8969181	9.0957192	9.2945709	9.4934703	9.6924145	11.683817	13.677705	15.673136	17.669592	19.666763	.36
.37	8.7246907	8.9234413	9.1222458	9.3211009	9.5200034	9.7189505	11.710375	13.704275	15.699715	17.696176	19.693351	.37
.38	8.7509783	8.9497326	9.1485406	9.3473990	9.5463046	9.7452545	11.736700	13.730613	15.726061	17.722528	19.719707	.38
.39	8.7770561	8.9758140	9.1746255	9.3734871	9.5723957	9.7713485	11.762815	13.756741	15.752196	17.748669	19.745852	.39
.40	8.8029450	9.0017066	9.2005214	9.3993862	9.5982978	9.7972533	11.788741	13.782679	15.778142	17.774621	19.771807	.40
.41	8.8286649	9.0274301	9.2262483	9.4251162	9.6240308	9.8229891	11.814497	13.808447	15.803919	17.800403	19.797593	.41
.42	8.8542351	9.0530038	9.2518253	9.4506963	9.6496138	9.8485748	11.840103	13.834065	15.829545	17.826034	19.823228	.42
.43	8.8796737	9.0784460	9.2772708	9.4761448	9.6750652	9.8740290	11.865577	13.859551	15.855039	17.851533	19.848731	.43
.44	8.9049987	9.1037744	9.3026024	9.5014796	9.7004028	9.8993692	11.890937	13.884924	15.880419	17.876918	19.874120	.44
.45	8.9302272	9.1290063	9.3278376	9.5267177	9.7256438	9.9246129	11.916200	13.910199	15.905702	17.902207	19.899412	.45
.46	8.9553760	9.1541585	9.3529930	9.5518761	9.7508050	9.9497767	11.941384	13.935394	15.930904	17.927415	19.924624	.46
.47	8.9804616	9.1792475	9.3780851	9.5769712	9.7759028	9.9748772	11.966504	13.960525	15.956044	17.952559	19.949772	.47
.48	9.0055000	9.2042892	9.4031299	9.6020190	9.8009534	9.9999304	11.991576	13.985610	15.981135	17.977656	19.974873	.48
.49	9.0305071	9.2292997	9.4281436	9.6270355	9.8259727	10.024952	12.016617	14.010662	16.006195	18.002721	19.999942	.49
.50	9.0554989	9.2542948	9.4531417	9.6520366	9.8509765	10.049959	12.041643	14.035699	16.031240	18.027771	20.024995	.50

$P \setminus d$	9.0	9.2	9.4	9.6	9.8	10.0	$\bar{R} = R * u$,	14.0	16.0	18.0	20.0	d/P
.50	9.0554989	9.2542948	9.4531417	9.6520366	9.8509765	10.049959	12.041643	14.035699	16.031240	18.027771	20.024995	.50
.51	9.0804909	9.2792901	9.4781401	9.6770379	9.8759805	10.074965	12.066668	14.060736	16.056284	18.052820	20.050048	.51
.52	9.1054990	9.3043014	9.5031545	9.7020551	9.9010004	10.099988	12.091710	14.085789	16.081345	18.077886	20.075117	.52
.53	9.1305388	9.3293445	9.5282006	9.7271041	9.9260521	10.125042	12.116783	14.110874	16.106437	18.102983	20.100218	.53
.54	9.1556263	9.3544353	9.5532945	9.7522008	9.9511515	10.150144	12.141903	14.136006	16.131576	18.128127	20.125366	.54
.55	9.1807777	9.3795899	9.5784521	9.7773614	9.9763147	10.175310	12.167088	14.161201	16.156779	18.153336	20.150578	.55
.56	9.2060094	9.4048248	9.6036901	9.8026021	10.001558	10.200556	12.192353	14.186478	16.182063	18.178624	20.175870	.56
.57	9.2313381	9.4301568	9.6290251	9.8279400	10.026899	10.225899	12.217714	14.211851	16.207443	18.204010	20.201259	.57
.58	9.2567812	9.4556030	9.6544743	9.8533921	10.052353	10.251356	12.243190	14.237338	16.232938	18.229510	20.226763	.58
.59	9.2823563	9.4811814	9.6800557	9.8789763	10.077940	10.276945	12.268799	14.262958	16.258565	18.255142	20.252399	.59
.60	9.3080819	9.5069102	9.7057875	9.9047110	10.103678	10.302685	12.294557	14.288728	16.284342	18.280924	20.278185	.60
.61	9.3339770	9.5328086	9.7316890	9.9306152	10.129585	10.328595	12.320485	14.314667	16.310290	18.306877	20.304141	.61
.62	9.3600617	9.5588965	9.7577799	9.9567091	10.155681	10.354694	12.346603	14.340797	16.336426	18.333019	20.330287	.62
.63	9.3863569	9.5851949	9.7840814	9.9830134	10.181988	10.381003	12.372932	14.367137	16.362774	18.359371	20.356643	.63
.64	9.4128846	9.6117259	9.8106154	10.009550	10.208528	10.407545	12.399493	14.393709	16.389354	18.385957	20.383232	.64
.65	9.4396681	9.6385126	9.8374052	10.036343	10.235323	10.434343	12.426310	14.420538	16.416190	18.412798	20.410078	.65
.66	9.4667320	9.6655798	9.8644755	10.063416	10.262399	10.461422	12.453407	14.447647	16.443308	18.439921	20.437204	.66
.67	9.4941028	9.6929539	9.8918526	10.090796	10.289782	10.488807	12.480812	14.475064	16.470732	18.467350	20.464637	.67
.68	9.5218084	9.7206628	9.9195647	10.118511	10.317500	10.516527	12.508552	14.502815	16.498491	18.495115	20.492406	.68
.69	9.5498793	9.7487370	9.9476421	10.146591	10.345583	10.544613	12.536657	14.530933	16.526616	18.523246	20.520541	.69
.70	9.5783479	9.7772091	9.9761172	10.175070	10.374064	10.573097	12.565161	14.559448	16.555140	18.551775	20.549073	.70
.71	9.6072497	9.8061142	10.005026	10.203981	10.402978	10.602014	12.594098	14.588397	16.584097	18.580737	20.578040	.71
.72	9.6366231	9.8354910	10.034406	10.233364	10.432364	10.631402	12.623506	14.617819	16.613526	18.610172	20.607479	.72
.73	9.6665100	9.8653815	10.064299	10.263261	10.462263	10.661305	12.653429	14.647754	16.643470	18.640122	20.637433	.73
.74	9.6969567	9.8958316	10.094753	10.293717	10.492723	10.691767	12.683912	14.678250	16.673974	18.670632	20.667947	.74
.75	9.7280139	9.9268924	10.125817	10.324785	10.523793	10.722840	12.715006	14.709357	16.705090	18.701753	20.699073	.75
.76	9.7597382	9.9586203	10.157548	10.356519	10.555531	10.754580	12.746768	14.741132	16.736873	18.733543	20.730866	.76
.77	9.7921922	9.9910780	10.190009	10.388984	10.587998	10.787051	12.779260	14.773637	16.769388	18.766063	20.763391	.77
.78	9.8254465	10.024336	10.223271	10.422249	10.621266	10.820322	12.812553	14.806944	16.802703	18.799385	20.796718	.78
.79	9.8595806	10.058474	10.257412	10.456393	10.655414	10.854473	12.846727	14.841131	16.836900	18.833588	20.830926	.79
.80	9.8946843	10.093582	10.292524	10.491508	10.690532	10.889594	12.881871	14.876290	16.872068	18.868763	20.866105	.80
.81	9.9308607	10.129762	10.328708	10.527696	10.726723	10.925788	12.918089	14.912522	16.908310	18.905012	20.902358	.81
.82	9.9682280	10.167133	10.366083	10.565075	10.764106	10.963173	12.955499	14.949947	16.945745	18.942453	20.939805	.82
.83	10.006924	10.205833	10.404787	10.603782	10.802817	11.001888	12.994238	14.988702	16.984510	18.981225	20.978583	.83
.84	10.047108	10.246022	10.444980	10.643979	10.843017	11.042092	13.034468	15.028948	17.024766	19.021489	21.018852	.84
.85	10.088972	10.287890	10.486852	10.685855	10.884897	11.083975	13.076378	15.070875	17.066704	19.063435	21.060803	.85
.86	10.132742	10.331665	10.530631	10.729638	10.928684	11.127766	13.120196	15.114710	17.110551	19.107289	21.104663	.86
.87	10.178692	10.377620	10.576591	10.775602	10.974652	11.173738	13.166197	15.160729	17.156581	19.153328	21.150708	.87
.88	10.227161	10.426094	10.625069	10.824085	11.023139	11.222229	13.214718	15.209269	17.205134	19.201889	21.199275	.88
.89	10.27568	10.477506	10.676487	10.875507	11.074566	11.273660	13.266181	15.260751	17.256630	19.253394	21.250787	.89
.90	10.333449	10.532393	10.731379	10.930405	11.129468	11.328566	13.320121	15.315712	17.311605	19.308379	21.305779	.90
.91	10.392501	10.591451	10.790442	10.989473	11.188541	11.387644	13.380235	15.374849	17.370756	19.367541	21.364948	.91
.92	10.456654	10.655610	10.854608	11.053645	11.252718	11.451826	13.444455	15.439093	17.435016	19.431812	21.429228	.92
.93	10.527195	10.726158	10.925163	11.124205	11.323285	11.522398	13.515070	15.509734	17.505674	19.502483	21.499907	.93
.94	10.605981	10.804952	11.003963	11.203013	11.402098	11.601218	13.593935	15.588628	17.584589	19.581411	21.578845	.94
.95	10.695838	10.894818	11.093837	11.292894	11.491987	11.691114	13.683884	15.678609	17.674591	19.671429	21.668874	.95
.96	10.801413	11.000402	11.199431	11.398497	11.597598	11.796733	13.789562	15.784326	17.780334	19.777189	21.774648	.96
.97	10.931208	11.130209	11.329249	11.528326	11.727437	11.926581	13.919483	15.914293	17.910331	19.907208	21.904683	.97
.98	11.103755	11.302772	11.501826	11.700917	11.900041	12.099197	14.092194	16.087064	18.083142	20.080048	22.077543	.98
.99	11.375728	11.574768	11.773845	11.972956	12.172100	12.371276	14.364416	16.359377	18.355517	20.352466	22.349994	.99

$P \backslash d$	20.0	25.0	30.0	35.0	40.0	45.0	$\bar{R} = R * u,$	$\bar{d} = d * u$	60.0	65.0	70.0	d/P
.01	17.700223	22.694641	27.690999	32.688434	37.686530	42.685060	47.683892	52.682941	57.682151	62.681485	67.680916	.01
.02	17.972623	22.967117	27.963514	32.960972	37.959083	42.957623	47.956462	52.955516	57.954730	62.954067	67.953501	.02
.03	18.145455	23.139996	28.136417	33.133889	38.132009	43.130556	48.129399	53.128456	58.127673	63.127012	68.126447	.03
.04	18.275470	23.270046	28.266485	33.263968	38.262095	43.260646	48.259493	53.258552	58.257771	63.257112	68.256547	.04
.05	18.381228	23.375832	28.372286	33.369778	38.367910	43.366465	48.365314	53.364376	58.363596	63.362938	68.362374	.05
.06	18.471245	23.465872	28.462339	33.459838	38.457975	43.456534	48.455385	53.454448	58.453669	63.453012	68.452450	.06
.07	18.550173	23.544821	28.541298	33.538804	38.536945	43.535506	48.534359	53.533424	58.532646	63.531990	68.531428	.07
.08	18.620844	23.615509	28.611996	33.609508	38.607653	43.606216	48.605071	53.604137	58.603361	63.602705	68.602144	.08
.09	18.685116	23.679798	28.676294	33.673810	38.671959	43.670524	48.669381	53.668448	58.667673	63.667018	68.666457	.09
.10	18.744279	23.738976	28.735480	33.733001	38.731152	43.729720	48.728578	53.727647	58.726872	63.726217	68.725657	.10
.11	18.799265	23.793976	28.790487	33.788013	38.786167	43.784737	48.783596	53.782665	58.781891	63.781238	68.780678	.11
.12	18.850772	23.845496	28.842013	33.839543	38.837700	43.836271	48.835132	53.834202	58.833429	63.832776	68.832217	.12
.13	18.899335	23.894070	28.890595	33.888128	38.886288	43.884861	48.883723	53.882794	58.882021	63.881368	68.880810	.13
.14	18.945375	23.940123	28.936653	33.934190	38.932352	43.930927	48.929790	53.928862	58.928090	63.927437	68.926879	.14
.15	18.989232	23.983990	28.980526	33.978067	38.976231	43.974807	48.973671	53.972744	58.971973	63.971321	68.970763	.15
.16	19.031179	24.025948	29.022490	34.020034	39.018199	44.016777	49.015643	54.014716	59.013945	64.013294	69.012736	.16
.17	19.071445	24.066224	29.062771	34.060318	39.058486	44.057065	49.055931	54.055005	59.054235	64.053584	69.053027	.17
.18	19.110219	24.105007	29.101559	34.099110	39.095860	44.094727	49.093802	54.093302	59.093032	64.092382	69.091825	.18
.19	19.147663	24.142460	29.139017	34.136571	39.134742	44.133324	49.132192	54.131268	59.130498	64.129848	69.129292	.19
.20	19.183914	24.178720	29.175282	34.172838	39.171011	44.169595	49.168464	54.167540	59.166771	64.166121	69.165565	.20
.21	19.219091	24.213906	29.210472	34.208031	39.206206	44.204790	49.203660	54.202737	59.201968	64.201319	69.200763	.21
.22	19.253297	24.248119	29.244690	34.242251	39.240428	44.239014	49.237884	54.236962	59.236194	64.235545	69.234989	.22
.23	19.286621	24.281452	29.278027	34.275591	39.273769	44.272356	49.271227	54.270305	59.269538	64.268889	69.268334	.23
.24	19.319144	24.313983	29.310562	34.308128	39.306308	44.304896	49.303768	54.302847	59.302080	64.301432	69.300876	.24
.25	19.350936	24.345782	29.342366	34.339934	39.338116	44.336705	49.335578	54.334657	59.333891	64.333243	69.332688	.25
.26	19.382060	24.376914	29.373501	34.371072	39.369256	44.367845	49.366719	54.365799	59.365033	64.364385	69.363830	.26
.27	19.412572	24.407433	29.404025	34.401598	39.399783	44.398374	49.397248	54.396329	59.395563	64.394916	69.394361	.27
.28	19.442524	24.437393	29.433988	34.431563	39.429750	44.428342	49.427217	54.426298	59.425532	64.424885	69.424331	.28
.29	19.471962	24.466837	29.463436	34.461014	39.459202	44.457795	49.456671	54.455752	59.454987	64.454340	69.453786	.29
.30	19.500928	24.495809	29.492412	34.489992	39.488181	44.486775	49.485652	54.484734	59.483969	64.483323	69.482769	.30
.31	19.529459	24.524348	29.520954	34.518537	39.516727	44.515322	49.514199	54.513282	59.512517	64.511871	69.511318	.31
.32	19.557593	24.552488	29.549098	34.546682	39.544874	44.543470	49.542348	54.541431	59.540667	64.540021	69.539468	.32
.33	19.585360	24.580262	29.576875	34.574462	39.572655	44.571252	49.570131	54.569214	59.568451	64.567805	69.567252	.33
.34	19.612793	24.607701	29.604318	34.601906	39.600101	44.598699	49.597578	54.596662	59.595899	64.595254	69.594701	.34
.35	19.639918	24.634833	29.631453	34.629043	39.627239	44.625838	49.624718	54.623802	59.623040	64.622395	69.621842	.35
.36	19.666763	24.661683	29.658307	34.655900	39.654097	44.652696	49.651577	54.650662	59.649899	64.649255	69.648702	.36
.37	19.693351	24.688278	29.684905	34.682500	39.680698	44.679298	49.678180	54.677265	59.676503	64.675859	69.675306	.37
.38	19.719707	24.714640	29.711270	34.708867	39.707067	44.705668	49.704550	54.703635	59.702874	64.702229	69.701678	.38
.39	19.745852	24.740791	29.737424	34.735023	39.733224	44.731826	49.730709	54.729795	59.729034	64.728390	69.727838	.39
.40	19.771807	24.766752	29.763389	34.760990	39.759192	44.757795	49.756678	54.755765	59.755004	64.754360	69.753809	.40
.41	19.797593	24.792544	29.789184	34.786786	39.784990	44.783594	49.782478	54.781565	59.780804	64.780161	69.779609	.41
.42	19.823228	24.818185	29.814828	34.812433	39.810638	44.809242	49.808126	54.807214	59.806454	64.805811	69.805260	.42
.43	19.848731	24.843694	29.840340	34.837947	39.836153	44.834758	49.833643	54.832731	59.831971	64.831328	69.830778	.43
.44	19.874120	24.869089	29.865738	34.863346	39.861554	44.860160	49.859046	54.858134	59.857374	64.856732	69.856181	.44
.45	19.899412	24.894386	29.891039	34.888649	39.886858	44.885465	49.884351	54.883440	59.882681	64.882038	69.881488	.45
.46	19.924624	24.919604	29.916259	34.913872	39.912081	44.910689	49.909576	54.908665	59.907906	64.907264	69.906714	.46
.47	19.949772	24.944758	29.941416	34.939030	39.937241	44.935850	49.934737	54.933827	59.933069	64.932427	69.931877	.47
.48	19.974873	24.969864	29.966525	34.964141	39.962354	44.960963	49.959851	54.958941	59.958183	64.957542	69.956992	.48
.49	19.999942	24.994938	29.991603	34.989221	39.987434	44.986045	49.984933	54.984024	59.983266	64.982625	69.982075	.49
.50	20.024995	25.019997	30.016665	35.014285	40.012499	45.011111	50.010000	55.009091	60.008333	65.007692	70.007143	.50

$P \backslash d$	$R = R(P, d)$ where probability $P = P(R, d)$,										$\bar{R} = R * u,$	$\bar{d} = d * u$	60.0	65.0	70.0	d/P
	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	d/P						
.50	20.024995	25.019997	30.016665	35.014285	40.012499	45.011111	50.010000	55.009091	60.008333	65.007692	70.007143	.50				
.51	20.050048	25.045056	30.041727	35.039349	40.037564	45.036176	50.035066	55.034157	60.033400	65.032760	70.032210	.51				
.52	20.075117	25.070131	30.066805	35.064428	40.062645	45.061258	50.060148	55.059240	60.058483	65.057843	70.057294	.52				
.53	20.100218	25.095237	30.091914	35.089539	40.087757	45.086371	50.085262	55.084354	60.083598	65.082958	70.082409	.53				
.54	20.125366	25.120391	30.117071	35.114698	40.112917	45.111532	50.110423	55.109516	60.108760	65.108120	70.107571	.54				
.55	20.150578	25.145609	30.142292	35.139921	40.138141	45.136757	50.135648	55.134742	60.133986	65.133346	70.132798	.55				
.56	20.175870	25.170906	30.167593	35.165223	40.163445	45.162061	50.160954	55.160047	60.159292	65.158652	70.158104	.56				
.57	20.201259	25.196301	30.192991	35.190623	40.188846	45.187463	50.186356	55.185450	60.184695	65.184056	70.183508	.57				
.58	20.226763	25.221811	30.218503	35.216137	40.214361	45.212979	50.211873	55.210967	60.210213	65.209574	70.209026	.58				
.59	20.252399	25.247452	30.244147	35.241783	40.240009	45.238628	50.237522	55.236617	60.235862	65.235224	70.234676	.59				
.60	20.278185	25.273244	30.269942	35.267580	40.265807	45.264427	50.263322	55.262417	60.261663	65.261024	70.260477	.60				
.61	20.304141	25.299206	30.295907	35.293547	40.291775	45.290395	50.289291	55.288387	60.287633	65.286995	70.286448	.61				
.62	20.330287	25.325357	30.322062	35.319704	40.317933	45.316554	50.315450	55.314546	60.313793	65.313155	70.312608	.62				
.63	20.356643	25.351719	30.348427	35.346071	40.344301	45.342923	50.341820	55.340917	60.340164	65.339526	70.338979	.63				
.64	20.383232	25.378314	30.375025	35.372671	40.370902	45.369525	50.368423	55.367520	60.366767	65.366130	70.365583	.64				
.65	20.410078	25.405165	30.401880	35.399527	40.397760	45.396384	50.395282	55.394379	60.393627	65.392990	70.392444	.65				
.66	20.437204	25.432297	30.429015	35.426664	40.424898	45.423523	50.422422	55.421520	60.420768	65.420131	70.419585	.66				
.67	20.464637	25.459737	30.456457	35.454109	40.452344	45.450970	50.449869	55.448968	60.448216	65.447579	70.447034	.67				
.68	20.492406	25.487511	30.484235	35.481889	40.480126	45.478752	50.477652	55.476751	60.476000	65.475363	70.474818	.68				
.69	20.520541	25.515652	30.512379	35.510035	40.508273	45.506900	50.505801	55.504900	60.504149	65.503513	70.502968	.69				
.70	20.549073	25.544191	30.540922	35.538579	40.536819	45.535447	50.534348	55.533448	60.532697	65.532062	70.531517	.70				
.71	20.578040	25.573164	30.569898	35.567558	40.565798	45.564428	50.563329	55.562430	60.561680	65.561044	70.560499	.71				
.72	20.607479	25.602609	30.599347	35.597009	40.595251	45.593881	50.592783	55.591884	60.591134	65.590499	70.589955	.72				
.73	20.637433	25.632569	30.629310	35.626974	40.625218	45.623849	50.622752	55.621853	60.621104	65.620469	70.619925	.73				
.74	20.667947	25.663090	30.659834	35.657500	40.655745	45.654377	50.653381	55.652383	60.651634	65.651000	70.650456	.74				
.75	20.699073	25.694222	30.690970	35.688639	40.686885	45.685518	50.684423	55.683525	60.682776	65.682142	70.681598	.75				
.76	20.730866	25.726023	30.722775	35.720445	40.718693	45.717327	50.716232	55.715335	60.714587	65.713953	70.713410	.76				
.77	20.763391	25.758555	30.755310	35.752983	40.751232	45.749867	50.748773	55.747877	60.747129	65.746496	70.745952	.77				
.78	20.796718	25.791888	30.788648	35.786323	40.784573	45.783210	50.782116	55.781221	60.780473	65.779840	70.779297	.78				
.79	20.830926	25.826103	30.822866	35.820544	40.818796	45.817434	50.816341	55.815446	60.814699	65.814066	70.813523	.79				
.80	20.866105	25.861289	30.858057	35.855737	40.853991	45.852629	50.851538	55.850643	60.849896	65.849264	70.848721	.80				
.81	20.902358	25.897551	30.894322	35.892005	40.890260	45.888900	50.887809	55.886915	60.886169	65.885537	70.884995	.81				
.82	20.939805	25.935005	30.931781	35.929466	40.927724	45.926364	50.925274	55.924381	60.923635	65.923004	70.922462	.82				
.83	20.978583	25.973791	30.970571	35.968259	40.966518	45.965160	50.964071	55.963178	60.962433	65.961802	70.961260	.83				
.84	21.018852	26.014068	31.010853	36.008543	41.006804	46.005448	51.004359	56.003467	61.002723	66.002092	71.001550	.84				
.85	21.060803	26.056027	31.052817	36.050511	41.048774	46.047418	51.046331	56.045439	61.044695	66.044065	71.043524	.85				
.86	21.104663	26.099897	31.096692	36.094388	41.092653	46.091299	51.090213	56.089322	61.088578	66.087948	71.087408	.86				
.87	21.150708	26.145951	31.142751	36.140451	41.138718	46.137365	51.136280	56.135390	61.134647	66.134017	71.133477	.87				
.88	21.199275	26.194529	31.191334	36.189037	41.187306	46.185955	51.184871	56.183982	61.183239	66.182610	71.182070	.88				
.89	21.250787	26.246051	31.242862	36.240568	41.238840	46.237490	51.236407	56.235519	61.234777	66.234149	71.233609	.89				
.90	21.305779	26.301053	31.297871	36.295581	41.293855	46.292507	51.291425	56.290538	61.289797	66.289169	71.288630	.90				
.91	21.364948	26.360235	31.357059	36.354773	41.353050	46.351703	51.350623	56.349737	61.348996	66.348369	71.347830	.91				
.92	21.429228	26.424527	31.421358	36.419077	41.417356	46.416012	51.414933	56.414048	61.413309	66.412682	71.412144	.92				
.93	21.499907	26.495221	31.492059	36.489783	41.488065	46.486723	51.485646	56.484762	61.484003	66.483397	71.482860	.93				
.94	21.578845	26.574174	31.571021	36.568750	41.567036	46.565697	51.564621	56.563738	61.563001	66.562375	71.561838	.94				
.95	21.668874	26.664221	31.661078	36.658813	41.657103	46.655766	51.654692	56.653811	61.653075	66.652450	71.651914	.95				
.96	21.774648	26.770015	31.766883	36.764625	41.762920	46.761586	51.760515	56.759635	61.758900	66.758276	71.757741	.96				
.97	21.904683	26.900075	31.896957	36.894708	41.893008	46.891678	51.890610	56.889732	61.888999	66.888377	71.887842	.97				
.98	22.077543	27.072968	32.069869	37.067630	42.065938	47.064614	52.063549	57.062674	62.061943	67.061322	72.060789	.98				
.99	22.349994	27.345469	32.342399	37.340178	42.338497	47.337181	52.336122	57.335252	62.334524	67.333906	72.333374	.99				

$P \backslash d$	70.0	75.0	80.0	85.0	90.0	95.0	$\bar{R} = R * u,$	$\bar{d} = d * u$	100.0	110.0	115.0	120.0	d/ .01
.01	67.680916	72.680424	77.679995	82.679616	87.679281	92.678981	97.678711	102.678470	107.67825	112.67804	117.67786	117.67786	.01
.02	67.953501	72.953011	77.952583	82.952206	87.951871	92.951572	97.951303	102.95106	107.95084	112.95064	117.95045	117.95045	.02
.03	68.126447	73.125958	78.125531	83.125155	88.124821	93.124522	98.124254	103.12401	108.12379	113.12359	118.12341	118.12341	.03
.04	68.256547	73.256060	78.255633	83.255258	88.254924	93.254626	98.254358	103.25412	108.25390	113.25370	118.25351	118.25351	.04
.05	68.362374	73.361887	78.361461	83.361086	88.360753	93.360456	98.360188	103.35995	108.35973	113.35953	118.35934	118.35934	.05
.06	68.452450	73.451963	78.451538	83.451163	88.450830	93.450533	98.450266	103.45002	108.44980	113.44960	118.44942	118.44942	.06
.07	68.531428	73.530942	78.530517	83.530143	88.529811	93.529513	98.529246	103.52900	108.52879	113.52858	118.52840	118.52840	.07
.08	68.602144	73.601658	78.601234	83.600860	88.600528	93.600231	98.599964	103.59972	108.59950	113.59930	118.59912	118.59912	.08
.09	68.666457	73.665972	78.665548	83.665174	88.664842	93.664546	98.664279	103.66404	108.66382	113.66362	118.66344	118.66344	.09
.10	68.725657	73.725173	78.724749	83.724376	88.724044	93.723747	98.723481	103.72324	108.72302	113.72282	118.72264	118.72264	.10
.11	68.780678	73.780194	78.779770	83.779397	88.779066	93.778769	98.778503	103.77826	108.77804	113.77784	118.77766	118.77766	.11
.12	68.832217	73.831733	78.831309	83.830937	88.830605	93.830309	98.830043	103.82980	108.82958	113.82938	118.82920	118.82920	.12
.13	68.880810	73.880326	78.879903	83.879530	88.879199	93.878903	98.878637	103.87840	108.87818	113.87798	118.87780	118.87780	.13
.14	68.926879	73.926396	78.925973	83.925601	88.925270	93.924974	98.924708	103.92447	108.92425	113.92405	118.92387	118.92387	.14
.15	68.970763	73.970280	78.969857	83.969485	88.969154	93.968859	98.968593	103.96835	108.96813	113.96793	118.96775	118.96775	.15
.16	69.012736	74.012253	79.011831	84.011459	89.011129	94.010833	99.010567	104.01033	109.01011	114.00991	119.00973	119.00973	.16
.17	69.053027	74.052544	79.052122	84.051750	89.051420	94.051124	99.050859	104.05062	109.05040	114.05020	119.05002	119.05002	.17
.18	69.091825	74.091342	79.090921	84.090549	89.090219	94.089924	99.089658	104.08942	109.08920	114.08900	119.08882	119.08882	.18
.19	69.129292	74.128810	79.128388	84.128017	89.127686	94.127391	99.127126	104.12689	109.12667	114.12647	119.12629	119.12629	.19
.20	69.165565	74.165083	79.164662	84.164290	89.163960	94.163665	99.163400	104.16316	109.16294	114.16274	119.16256	119.16256	.20
.21	69.200763	74.200281	79.199860	84.199489	89.199159	94.198864	99.198599	104.19836	109.19814	114.19794	119.19776	119.19776	.21
.22	69.234989	74.234508	79.234087	84.233716	89.233386	94.233091	99.232826	104.23259	109.23237	114.23217	119.23199	119.23199	.22
.23	69.268334	74.267853	79.267432	84.267061	89.266732	94.266437	99.266172	104.26593	109.26571	114.26551	119.26533	119.26533	.23
.24	69.300876	74.300396	79.299975	84.299604	89.299275	94.298980	99.298715	104.29848	109.29826	114.29806	119.29788	119.29788	.24
.25	69.332688	74.332207	79.331787	84.331416	89.331087	94.330792	99.330527	104.33029	109.33007	114.32987	119.32969	119.32969	.25
.26	69.363830	74.363350	79.362930	84.362559	89.362230	94.361936	99.361671	104.36143	109.36121	114.36101	119.36083	119.36083	.26
.27	69.394361	74.393881	79.393461	84.393091	89.392762	94.392467	99.392202	104.39196	109.39175	114.39155	119.39136	119.39136	.27
.28	69.424331	74.423851	79.423431	84.423061	89.422732	94.422438	99.422173	104.42193	109.42172	114.42152	119.42134	119.42134	.28
.29	69.453786	74.453307	79.452887	84.452517	89.452188	94.451894	99.451629	104.45139	109.45117	114.45097	119.45079	119.45079	.29
.30	69.482769	74.482289	79.481870	84.481500	89.481171	94.480877	99.480613	104.48037	109.48016	114.47996	119.47978	119.47978	.30
.31	69.511318	74.510838	79.510419	84.510049	89.509721	94.509427	99.509162	104.50892	109.50871	114.50851	119.50832	119.50832	.31
.32	69.539468	74.538989	79.538569	84.538200	89.537871	94.537577	99.537313	104.53707	109.53686	114.53666	119.53648	119.53648	.32
.33	69.567252	74.566773	79.566354	84.565984	89.565656	94.565362	99.565098	104.56486	109.56464	114.56444	119.56426	119.56426	.33
.34	69.594701	74.594222	79.593803	84.593433	89.593105	94.592811	99.592547	104.59231	109.59209	114.59189	119.59171	119.59171	.34
.35	69.621842	74.621363	79.620945	84.620575	89.620247	94.619953	99.619689	104.61945	109.61923	114.61903	119.61885	119.61885	.35
.36	69.648702	74.648224	79.647805	84.647436	89.647108	94.646814	99.646550	104.64631	109.64609	114.64590	119.64571	119.64571	.36
.37	69.675306	74.674828	79.674410	84.674040	89.673712	94.673419	99.673155	104.67292	109.67270	114.67250	119.67232	119.67232	.37
.38	69.701678	74.701199	79.700781	84.700412	89.700084	94.699791	99.699527	104.69929	109.69907	114.69887	119.69869	119.69869	.38
.39	69.727838	74.727360	79.726942	84.726573	89.726245	94.725952	99.725688	104.72545	109.72523	114.72503	119.72485	119.72485	.39
.40	69.753809	74.753331	79.752913	84.752544	89.752216	94.751923	99.751659	104.75142	109.75120	114.75101	119.75082	119.75082	.40
.41	69.779609	74.779132	79.778714	84.778345	89.778018	94.777724	99.777461	104.77722	109.77701	114.77681	119.77663	119.77663	.41
.42	69.805260	74.804782	79.804364	84.803996	89.803668	94.803375	99.803112	104.80287	109.80266	114.80246	119.80228	119.80228	.42
.43	69.830778	74.830300	79.829883	84.829514	89.829187	94.828894	99.828630	104.82839	109.82817	114.82798	119.82780	119.82780	.43
.44	69.856181	74.855704	79.855287	84.854918	89.854591	94.854298	99.854035	104.85380	109.85358	114.85338	119.85320	119.85320	.44
.45	69.881488	74.881011	79.880593	84.880225	89.879898	94.879605	99.879342	104.87910	109.87889	114.87869	119.87851	119.87851	.45
.46	69.906714	74.906237	79.905820	84.905452	89.905125	94.904832	99.904569	104.90433	109.90411	114.90392	119.90373	119.90373	.46
.47	69.931877	74.931400	79.930983	84.930615	89.930288	94.929995	99.929732	104.92949	109.92928	114.92908	119.92890	119.92890	.47
.48	69.956992	74.956515	79.956098	84.955730	89.955403	94.955111	99.954848	104.95461	109.95439	114.95420	119.95401	119.95401	.48
.49	69.982075	74.981599	79.981182	84.980814	89.980487	94.980195	99.979932	104.97969	109.97948	114.97928	119.97910	119.97910	.49
.50	70.007143	75.006667	80.006250	85.005882	90.005555	95.005263	100.00500	105.00476	110.00455	115.00435	120.00417	120.00417	.50

$P \backslash d$	70.0	75.0	80.0	85.0	90.0	95.0	$\bar{R} = R * u,$	$\bar{d} = d * u$	110.	115.	120.	d/P
.50	70.007143	75.006667	80.006250	85.005882	90.005555	95.005263	100.00500	105.00476	110.00455	115.00435	120.00417	.50
.51	70.032210	75.031734	80.031318	85.030950	90.030624	95.030331	100.03007	105.02983	110.02961	115.02942	120.02924	.51
.52	70.057294	75.056818	80.056402	85.056034	90.055708	95.055415	100.05515	105.05491	110.05470	115.05450	120.05432	.52
.53	70.082409	75.081933	80.081517	85.081150	90.080823	95.080531	100.08027	105.08003	110.07981	115.07962	120.07944	.53
.54	70.107571	75.107096	80.106680	85.106313	90.105986	95.105694	100.10543	105.10519	110.10498	115.10478	120.10460	.54
.55	70.132798	75.132322	80.131906	85.131539	90.131213	95.130921	100.13066	105.13042	110.13020	115.13001	120.12983	.55
.56	70.158104	75.157629	80.157213	85.156846	90.156520	95.156228	100.15597	105.15573	110.15551	115.15531	120.15513	.56
.57	70.183508	75.183033	80.182617	85.182250	90.181924	95.181632	100.18137	105.18113	110.18092	115.18072	120.18054	.57
.58	70.209026	75.208551	80.208136	85.207769	90.207443	95.207151	100.20689	105.20665	110.20643	115.20624	120.20606	.58
.59	70.234676	75.234201	80.233786	85.233419	90.233093	95.232802	100.23254	105.23230	110.23209	115.23189	120.23171	.59
.60	70.260477	75.260002	80.259587	85.259221	90.258895	95.258603	100.25834	105.25810	110.25789	115.25769	120.25751	.60
.61	70.286448	75.285973	80.285558	85.285192	90.284866	95.284574	100.28431	105.28407	110.28386	115.28366	120.28348	.61
.62	70.312608	75.312134	80.311719	85.311353	90.311027	95.310735	100.31047	105.31024	110.31002	115.30982	120.30964	.62
.63	70.338979	75.338505	80.338090	85.337724	90.337399	95.337107	100.33685	105.33661	110.33639	115.33619	120.33601	.63
.64	70.365583	75.365109	80.364695	85.364329	90.364003	95.363712	100.36345	105.36321	110.36300	115.36280	120.36262	.64
.65	70.392444	75.391970	80.391555	85.391189	90.390864	95.390573	100.39031	105.39007	110.38986	115.38966	120.38948	.65
.66	70.419585	75.419111	80.418697	85.418331	90.418006	95.417715	100.41745	105.41722	110.41700	115.41680	120.41662	.66
.67	70.447034	75.446560	80.446146	85.445780	90.445455	95.445164	100.44490	105.44467	110.44445	115.44425	120.44407	.67
.68	70.474818	75.474345	80.473931	85.473565	90.473240	95.472949	100.47269	105.47245	110.47223	115.47204	120.47186	.68
.69	70.502968	75.502495	80.502081	85.501716	90.501391	95.501100	100.50084	105.50060	110.50039	115.50019	120.50001	.69
.70	70.531517	75.531044	80.530630	85.530265	90.529940	95.529649	100.52939	105.52915	110.52894	115.52874	120.52856	.70
.71	70.560499	75.560027	80.559613	85.559248	90.558923	95.558633	100.55837	105.55813	110.55792	115.55772	120.55754	.71
.72	70.589955	75.589482	80.589069	85.588704	90.588379	95.588089	100.58783	105.58759	110.58737	115.58718	120.58700	.72
.73	70.619925	75.619452	80.619039	85.618674	90.618350	95.618059	100.61780	105.61756	110.61735	115.61715	120.61697	.73
.74	70.650456	75.649984	80.649570	85.649206	90.648881	95.648591	100.64833	105.64809	110.64788	115.64768	120.64750	.74
.75	70.681598	75.681127	80.680713	85.680349	90.680025	95.679734	100.67947	105.67924	110.67902	115.67882	120.67864	.75
.76	70.713410	75.712938	80.712525	85.712161	90.711836	95.711546	100.71128	105.71105	110.71083	115.71064	120.71046	.76
.77	70.745952	75.745481	80.745068	85.744704	90.744380	95.744090	100.74383	105.74359	110.74338	115.74318	120.74300	.77
.78	70.779297	75.778826	80.778413	85.778049	90.777725	95.777435	100.77717	105.77694	110.77672	115.77653	120.77635	.78
.79	70.813523	75.813052	80.812640	85.812276	90.811952	95.811662	100.81140	105.81116	110.81095	115.81075	120.81057	.79
.80	70.848721	75.848251	80.847839	85.847475	90.847151	95.846861	100.84660	105.84636	110.84615	115.84595	120.84577	.80
.81	70.884995	75.884524	80.884112	85.883748	90.883425	95.883135	100.88287	105.88264	110.88242	115.88223	120.88205	.81
.82	70.922462	75.921991	80.921580	85.921216	90.920893	95.920603	100.92034	105.92011	110.91989	115.91970	120.91952	.82
.83	70.961260	75.960790	80.960378	85.960015	90.959692	95.959402	100.95914	105.95891	110.95869	115.95850	120.95832	.83
.84	71.001550	76.001081	81.000669	86.000306	90.999983	95.999694	100.99943	105.99920	110.99898	115.99879	120.99861	.84
.85	71.043524	76.043054	81.042643	86.042280	91.041957	96.041668	101.04141	106.04117	111.04096	116.04076	121.04058	.85
.86	71.087408	76.086938	81.086527	86.086165	91.085842	96.085553	101.08529	106.08506	111.08484	116.08465	121.08447	.86
.87	71.133477	76.133008	81.132597	86.132235	91.131912	96.131623	101.13136	106.13113	111.13091	116.13072	121.13054	.87
.88	71.182070	76.181602	81.181191	86.180829	91.180506	96.180218	101.17996	106.17972	111.17951	116.17931	121.17913	.88
.89	71.233609	76.233141	81.232731	86.232368	91.232046	96.231758	101.23150	106.23126	111.23105	116.23085	121.23067	.89
.90	71.288630	76.288162	81.287752	86.287390	91.287068	96.286779	101.28652	106.28628	111.28607	116.28588	121.28570	.90
.91	71.347830	76.347363	81.346953	86.346591	91.346270	96.345981	101.34572	106.34549	111.34527	116.34508	121.34490	.91
.92	71.412144	76.411676	81.411267	86.410906	91.410584	96.410296	101.41004	106.40980	111.40959	116.40939	121.40921	.92
.93	71.482860	76.482393	81.481984	86.481623	91.481301	96.481014	101.48075	106.48052	111.48031	116.48011	121.47993	.93
.94	71.561838	76.561372	81.560964	86.560603	91.560282	96.559994	101.55974	106.55950	111.55929	116.55909	121.55891	.94
.95	71.651914	76.651448	81.651040	86.650680	91.650359	96.650072	101.64981	106.64958	111.64937	116.64917	121.64899	.95
.96	71.757741	76.757276	81.756869	86.756509	91.756188	96.755901	101.75564	106.75541	111.75520	116.75500	121.75482	.96
.97	71.887842	76.887378	81.886971	86.886612	91.886292	96.886005	101.88575	106.88551	111.88530	116.88511	121.88493	.97
.98	72.060789	77.060326	82.059920	87.059561	92.059242	97.058956	102.05870	107.05846	112.05825	117.05806	122.05788	.98
.99	72.333374	77.332913	82.332509	87.332151	92.331833	97.331548	102.33129	107.33106	112.33085	117.33065	122.33047	.99

$P \setminus d$	0.00	0.05	0.10	0.25	0.50	0.75	1.00	1.50	2.00	3.00	4.00
.990000	3.0348543	3.0367489	3.0424074	3.0809861	3.2059990	3.3816797	3.5844940	4.0268178	4.4915326	5.4493683	6.4246669
.990500	3.0517089	3.0536140	3.0593035	3.0980794	3.2235879	3.3997007	3.6028002	4.0454335	4.5103107	5.4683120	6.4436912
.991000	3.0693748	3.0712909	3.0770128	3.1159953	3.2420207	3.4185821	3.6219770	4.0649308	4.5299765	5.4881499	6.4636127
.991500	3.0879408	3.0898685	3.0956245	3.1348237	3.2613896	3.4384178	3.6421191	4.0854056	4.5506265	5.5089791	6.4845293
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.999999	5.2565218	5.2597940	5.2694581	5.3315976	5.5045950	5.7141412	5.9377841	6.4035131	6.8812834	7.8531795	8.8357140

$P \backslash d$	4.00	5.00	6.00	$R = R(P, d)$ where probability $P = P(R, d)$, $\bar{R} = R * u$, $\bar{d} = d * u$					50.0	80.0	120.
.990000	6.4246669	7.4083270	8.3966846	10.381165	12.371276	17.357327	22.349994	32.342399	52.336122	82.332509	122.33047
.990500	6.4436912	7.4273968	8.4157828	10.400296	12.390423	17.376493	22.369166	32.361577	52.355303	82.351691	122.34966
.991000	6.4636127	7.4473658	8.4357813	10.420328	12.410472	17.396562	22.389243	32.381659	52.375388	82.371777	122.36974
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